HELSINKI SCHOOL OF ECONOMICS (HSE)
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SPECIAL PURPOSE ACQUISITION COMPANY

A first look into an emerging asset class

Finance
Master's thesis
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Spring 2008

Approved by the Council of the Department 10/6 2008 and awarded the grade good, 70 p.

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Helsinki School of Economics
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Abstract
May 23rd, 2008

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Purpose of the Study

This thesis presents the first empirical evidence on Special Purpose Acquisition Company (SPAC) as an asset class and studies its value creation ability from the investor perspective. SPAC is a public shell company that raises funds in an IPO for the purpose of seeking and acquiring a private company. After a target company is found, it is brought public by merging it with the SPAC in a reverse merger. To study the value creation ability of SPACs, the following research questions were formulated: i) Do abnormal returns for SPAC shareholders exist during the merger announcement and the merger completion events?, and ii) Can characteristics driving these returns be identified?

Data

The data sample used in this thesis consists of 152 SPACs listed in US exchanges during January 1st, 2003 – February 28th, 2008, and included in the Morgan Joseph Acquisition Company Index. Share prices, market index data, and trading volume data is retrieved from Thomson Datastream database. The data on the unique characteristics of SPACs is manually gathered from company filings in the SEC Edgar database.

Methodology

This study utilizes event study methodology to examine abnormal returns and cumulative abnormal returns in the two expected events – merger announcement and merger completion – during a SPAC's life cycle. In addition, multivariate regression is applied to determine the characteristics driving the abnormal returns.

Results

SPACs were found to destroy shareholder value after a merger by 4.33 % and by 12.84 % over holding periods of 20 and 70 days respectively. These negative returns are found to be driven by agency problems between shareholders and underwriters of SPAC IPOs, and also by the dilution caused by the dual-class shares held by the management. Results also show that the percentage of IPO proceeds placed in a trust fund can be considered a proxy for the quality of the SPAC. Despite the negative returns shown, we find SPACs to be a feasible asset class, with the condition of sufficient investor sophistication and activity.

Keywords

Mergers and acquisitions, Special Purpose Acquisition Company, blank check company, reverse merger

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1. Introduction

1.1. Background and motivation of the study

The year 2003 can be considered as the beginning of the modern era of blank check company (BCC) IPOs. While the idea of raising investment capital through an IPO first emerged in the 70's, lack of sound regulation and market conventions has hindered the formation of a functional market for these vehicles until recently.

The investor protection in Special Purpose Acquisition Companies (SPACs) is drastically higher than in BCCs during their first emergence in late 70's and later throughout the 80's. During that era BCCs were opaque and often abused leaving investors exposed to fraudulent activities by parties involved in the market. Today BCCs have re-emerged as SPACs. The key difference to earlier BCCs is the voluntary compliance to most restrictions set forth by the Rule 419 amendment to the Securities Act of 1933. While SPACs specifically are not, in their current form, subject to any revised regulation since the 1980's, the Securities and Exchange Commission (SEC) imposed regulation for similar asset classes has provided a solid base on which to build uniform market conventions. This worked for the benefit of both investors and promoters of SPACs as they appear to be catering to an existing demand. The improved investor protection has also resulted in increasing demand from hedge funds in particular and enabled a successful breakthrough to a mainstream asset class; during 2003-2007 the capital raised by SPAC IPOs in the US and UK totalled over 18 billion dollars making the SPAC market a noteworthy addition to the selection of publicly traded investment vehicles. Figure 1 shows the development of the combined US & UK SPAC market since the emergence of the current market in 2003.

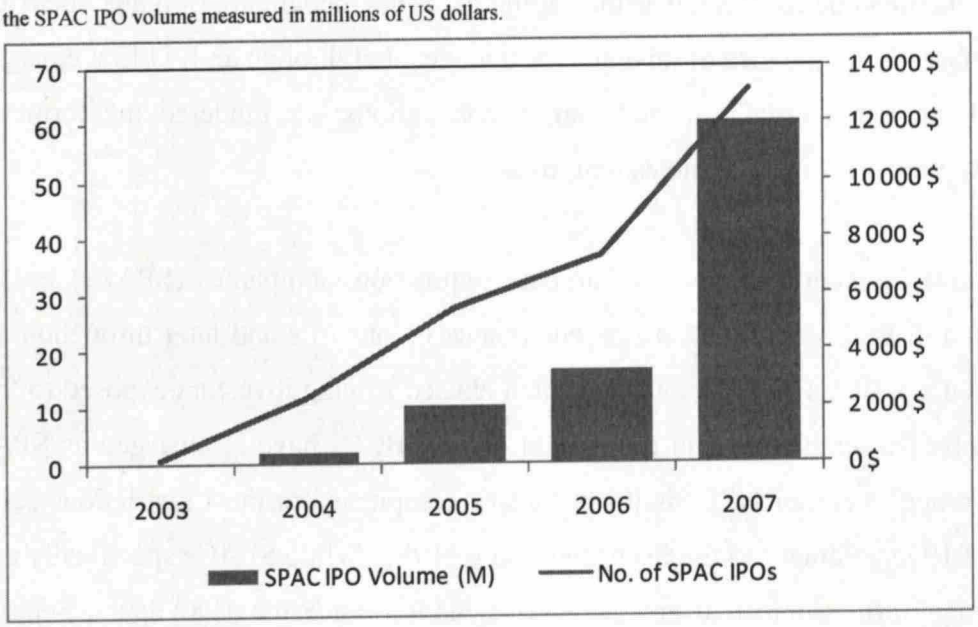
This study draws its key motivation from the complete lack of published research on BCCs. Reaching approximately 19 % of total US IPO volume in 2007[1], the growing market has now enabled a sufficient sample size to expect drawing conclusions regarding the performance of

[1] US IPO Volume in 2007: $65,149 million (PricewaterhouseCoopers 2007 US IPO Watch)

SPACs as a creator of value to the shareholders and to document how the market conventions are evolving and what the implications for investors are.

Figure 1. SPAC market development in 2003-2007

The figure presents the statistics for the combined US and UK SPAC market development in 2003-2007. The x-axis is the observation year. The left-hand side y-axis is the number of SPAC IPOs. The right-hand side y-axis is the SPAC IPO volume measured in millions of US dollars.



Source: SPAC Analytics

The aim of this study is to give an overview of SPACs as an asset class from the investor's perspective. An event study on two events in a SPACs life cycle is performed as I will first focus on market reactions to the announcement of a merger agreement and then to the announcement of the completion of the merger.

As will be explained in greater detail later in this study, SPACs carry several features that distinguish them from standard equity instruments. These features warrant an investigation to as they clearly have great implications on the behaviour of the SPAC share price. Understanding these features allows for more sophisticated investing in SPACs and enables investors to avoid the disadvantages that may arise from SPAC structures.

I study a sample of US listed SPACs included in the Morgan Joseph Acquisition Company Index (MJACI). Companies in the sample are listed on either the Pink Sheets OTC Markets or the American Stock Exchange (Amex). The sample data consists of the daily returns of

these companies during the announcements of two expected event windows in a SPAC's life cycle – the merger announcement and the merger completion.

1.2. Research problem and limitations

This study aims to examine SPAC share prices and daily returns to test for the existence of abnormal returns during the event windows of the two events, the merger announcement and the merger completion. A secondary objective of this study is to test for the value creation ability of SPAC as an asset class

In order to achieve these goals, the following research problems are formulated:

I. *Do abnormal returns for SPAC shareholders exist*
   a. *During a merger announcement?*
   b. *During a merger completion?*

II. *Which SPAC characteristics drive the share price performance and how relevant are they in explaining the returns to SPAC shareholders*

The main focus of this study is on the abnormal returns during the merger announcement and the merger completion events. As a side note, this study also acts as a first document into how the SPAC market conventions are evolving.

The main limitation of the study is the young age of the market. While the sample includes a total of 152 companies, a large portion of them are formed in 2007 and have not completed their life cycle by consummating a business combination or by being liquidated. This means that sample sizes for the studied events are smaller than the whole sample 152 observations. Further restricting the sample size is the availability of share price data, which can partially be attributed to the IPO format of unit offering. The final sample sizes for the two events stand at 74 for the merger announcement and 38 for the merger completion. In addition, 11 SPACs have been liquidated, but as the trading usually is halted shortly after the announcement of the disapproved merger, these liquidated SPACs can only be used to control results in the merger agreement announcement event.

1.3. Previous research and contribution

BCCs have currently not been the subject of any published research. As a first look into SPACs, this thesis employs several well established theories to examine how SPACs conform to the traditional finance theories and what the implications for investors are.

Previous research on blank check companies can be found in an unpublished working paper by Jog and Sun (2007), who find blank check IPOs to yield massive 1900% returns to the management teams[2]. Underpricing of blank check IPOs is found to be only 1.9 % on average, which is insignificant compared to the average underpricing documented in earlier studies (see, e.g. Hansen, 2000). Mean and median underwriter's fee in blank check IPOs is found to be approximately the industry standard 7 % for mid-sized IPOs. As Jog and Sun have documented, the underpricing aspects of blank check companies, I have chosen to neglect that aspect in my study. Partial reason for this decision is also the poor availability of immediate post-IPO share price (or unit price) data for unit offerings that trade only as a unit.

SPACs are also mentioned in detail by Sjostrom (2006) who makes a point to emphasize that SPACs are very different from a standard reverse merger as a means to go public and should not be evaluated as one.

This thesis contributes to existing research in several ways. First, it is the first study to document the developments of SPAC market conventions. Second, this thesis adds to the understanding of SPACs' ability to create shareholder value and highlights conflicts that affect this ability. Third area of contribution is the first analysis of SPAC characteristics and their relevance to the share price performance. Finally, and perhaps most importantly, this thesis lays ground for a wide array of future research on SPACs.

1.4. Definitions of key concepts

This section briefly defines the key concepts of this study.

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[2] It is worth noting that the median investment from the management is $25,000

Blank check company (BCC) A publicly listed shell company that has no cash-flow generating operations and is primarily used in reverse mergers.

Blank check IPO The general concept of fundraising through an IPO with the goal of finding a target company to complete a reverse merger with.

Reverse merger (also: reverse takeover) An alternative way of going public. In a reverse merger a company mergers with a blank check (or shell) company and gains its public status.

Special Purpose Acquisition Company (SPAC) A vehicle used for a blank check IPO that voluntarily complies with various restrictions to increase transparency and investor protection

1.5. Structure of the study

This paper is organized as follows. Section 2 presents an overview of the SPAC as an asset class, including a brief look on history and legislation. Section 3 summarizes the literature relevant to this thesis. Section 4 presents the hypotheses of the study and Section 5 describes the data sample and its properties. Section 5 describes data and the methodologies employed in this study. In Section 6 we document and analyze the results of the study and finally Section 8 summarizes my findings and concludes the thesis.

2. Special Purpose Acquisition Company – A brief overview

This section first defines SPAC, then summarizes the history of and legislation relevant to blank check companies. Finally the structure and process of a SPAC is described and key advantages and disadvantages are identified.

2.1. What are Special Purpose Acquisition Companies

SPAC is not an asset class officially defined by any regulatory body. SPAC is an investment vehicle designed to meet market demand by voluntarily complying to restrictions imposed on smaller blank check companies. This thesis defines SPAC as

"a blank check company raising funds via an unit IPO and voluntarily complying with restrictions similar to those imposed by SEC Rule 419."

Blank check companies are defined by SEC as

"... a development stage company that has no specific business plan or purpose or has indicated its business plan is to engage in a merger or acquisition with an unidentified company or companies, other entity, or person. These very small companies typically involve speculative investments and often fall within the SEC's definition of 'penny stocks' or are considered 'microcap stocks.'"[3]

SPAC is a special purpose vehicle designed to give public investors access to private markets, which typically are available only to private equity funds. SPAC is a so called blank check company as it has no operations, but it does not fall under the penny stock category due to its larger market capitalization and higher share price.

This empty shell company is taken public in an IPO by a management team with the sole aim of merging with or acquiring a private company using the proceeds from the IPO and

3 http://www.sec.gov/answers/blankcheck.htm, retrieved February 22nd, 2008

optional debt financing. Stock financed deals are also possible. The merger with the target company is a reverse merger, which is an alternative way of going public typically connected to smaller companies (see, e.g. Gleason et al., 2006). SPAC also falls in the category often referred to as "blind investment pools", which is a common expression for vehicles, such as private equity funds, where the investor is not aware of the eventual use of the funds invested. Common to all blind pool investments is that the associated risk is heavily dependent on the persons involved, making management track record a crucial element in evaluating the investment.

SPACs carry a pre-defined fixed liquidation date by which they must complete an acquisition or the company will be dissolved. Most of the proceeds from the IPO are placed in a trust fund until the consummation of a target business. If no merger takes place, the funds from the trust are returned to investors on a pro-rata basis.

2.2. A Brief History of blank check companies

During the 1980's blank check IPOs experienced their first hot issue period. However, this period was tainted by frauds and abuses that eventually led to diminishing of investor interest and trust, as well as the whole the market for blank check IPOs. During this era blank check IPOs were small and fell under the penny stock category.

In 1980's BCCs were used several times in a microcap stock fraud – a scheme where a penny stock share price is inflated and the stock is then sold to the public. The case of Hughes Capital Corporation (HCC) is widely regarded as the most notorious blank check fraud in history. In 1985 HCC raised $650,000 in a public offering and bought shares of in overpriced penny stock extensively owned by the HCC management.

The HCC incident eventually led to the Penny Stock Reform Act of 1990 and the Rule 419 amendment to the Securities Act of 1933, which helped to pave way for formation of SPACs today.

2.3. Overview of relevant legislation

SEC is the governing body for US SPACs. After a period of loose legislation on BCCs in the 1980's, several new regulations have been introduced. These laws have had a profound effect on the development of blank check IPOs into SPACs. The following sections describe these regulations and their effect on the evolution of blank check IPOs to SPACs.

2.3.1. The Penny Stock Reform Act

In 1990 the US Congress passed the Penny Stock Reform Act of 1990 (PSRA). PSRA authorized SEC to regulate the promoters of penny stock IPOs and set requirements for greater transparency in penny stock offerings greatly increasing the costs of listing such a company.

The real effect, however, remained superficial as penny stock companies circumvented the act by increasing their share or unit offer prices beyond the penny stock definition of $5. A feature also present in SPACs today as typical prices for the units offered range between $6 and $10. In the immediate post-PSRA period the abnormal returns of companies priced over $5 (i.e. non-penny stock companies) declined as did the number of IPOs in the penny stock category. The problem of issuer quality was not solved, but was spread out beyond the penny stock category. (Beatty and Kadiyala, 2003)

PSRA's main legacy regarding SPACs is the price of units issued in the IPO, which is typically set at $6, $8 or $10.

2.3.2. Rule 419

First piece of regulation applying specifically to blank check IPOs was the Rule 419 amendment to the Securities Act of 1933 introduced in 1992. Although Rule 419 does not apply to SPACs but focuses solely on blank check IPOs in the penny stock category, it has played a crucial role in the revival of the market for blank check IPOs. SPACs comply with most restrictions set forth by Rule 419 by market convention.

Rule 419 restricts blank check companies in five ways. First, Rule 419 states that 90 % of the funds raised in an offering by a blank check company must be placed on a third party escrow account until used in the expected merger or until the vehicle is liquidated, in which case the funds are returned to the investors. Second, Rule 419 stipulates that the net assets to be acquired must be valued at a minimum of 80 % of the IPO proceeds. Third restriction is an 18-month (plus the six-month extension period) limit for the acquisition. If the company is unable to complete or at least initiate a merger during this period, the company is liquidated and funds in the escrow will be returned to the investors along with any interest accrued. Fourth restriction increasing investor protection is the requirement of shareholder approval of 80% for the merger proposed by the management. Fifth restriction is that the pre-merger trading of blank check company shares is prohibited. This is the only restriction SPACs do not conform to in any form.

In practice the restrictions mean that 85-100% of the net proceeds from SPAC IPOs are placed in a trust fund investing in T-bills and accrue interest until the SPAC is liquidated or the acquisition is completed. When the management announces that it has entered into a merger agreement with a target company, a shareholder meeting is scheduled to carry out a voting process to approve the proposed merger. Without the approval the merger is withdrawn and the company moves to liquidation process.

Rule 419 applies on blank check companies trading at a share price of $5 or below and having net assets of less than $5 million (i.e. penny stocks). SPACs listed in 2003 or later do not fulfil either requirement and are therefore not legally bound to abide by Rule 419. However, SPACs voluntarily comply to restrictions similar to Rule 419 to increase their appeal to investors. As Rule 419 prohibits trading of securities issued under it, the current market convention of voluntary compliance is a way to achieve similar investor protection while maintaining secondary markets for blank check companies. Due to the voluntary nature of the self-imposed restrictions, SPACs are free to adjust the specifics of the restrictions in future issues. Current market conventions have evolved towards lower required shareholder approval level for the merger proposals and higher share of IPO proceeds to be placed in escrow[4].

[4] See Chapter 6 for details

2.3.3. The Sarbanes-Oxley Act

Arguably the most drastic increase in the regulation of public companies in the US was the introduction of the Public Company Accounting Reform and Investor Protection Act of 2002, or the Sarbanes-Oxley Act (SOX). In the wake of major accounting scandals in late 1990's and beginning of the following decade, SOX was introduced in 2002 to increase transparency and improve corporate governance practises in public companies. SOX has received harsh criticism for its high costs especially on smaller firms and many studies show the adverse effects of SOX on the number of new IPOs and increased level de-listings immediately after SOX took effect (see e.g. Asbaugh-Skaife et al., 2007; Carney, 2007).

Iliev (2007) shows that valuations of smaller public companies decreased after SOX came to effect mainly due to lower earnings caused by increased accounting costs.

On the positive side, Brau and Fawcett (2006) find some support in their partially interview based study for the notion that private companies do not see the increased liabilities of officers imposed by Sarbanes-Oxley as an impediment to going public. Also, companies listed on Pink Sheets OTC Markets or other OTC exchanges are not required to be SOX compliant. However, emphasis must be placed on the fact that SPACs in the US typically move to more liquid markets after completing a merger and must then eventually comply to SOX.

In conclusion, SOX has had a severely degrading effect on companies' willingness to go or stay public and has decreased the valuations of public companies. It is evident that challenges for vehicles such as SPACs or venture capital funds that aspire to list their portfolio companies, are much greater than in the pre-SOX era.

2.4. Structure and process

The following sections chronologically take the reader through the formation of a SPAC and describe the process leading up to the eventual acquisition or liquidation.

2.4.1. Pre-IPO period – Formation of the company

A SPAC is initially a newly formed development stage company with capital invested from the management team leading the SPAC and possible third party financial sponsors (original shareholders). Original shareholders typically invest $25,000 in exchange for what is equivalent to a 20 % ownership after the IPO. The size of the original shareholder's investment appears to be independent of the SPAC target size (IPO gross proceeds) and can be considered as a formality.

2.4.2. Initial public offering

American SPACs are typically listed on OTC Bulletin Board (OTCBB), Pink Sheets OTC Markets or American Stock Exchange. Smaller exchanges are preferred due to looser regulation and subsequently cheaper administrative costs. Recent trends are taking SPAC IPOs also to New York Stock Exchange and NASDAQ[5]. European SPACs have been listed on Alternative Investment Market of London Stock Exchange and NYSE Euronext. The choice of market place is typically driven by regulatory cost issues.

SPACs are offered in units traditionally consisting of a common share and one or two warrants. These units are usually priced at $6, $8 or $10. The warrants start trading separately from the shares after a pre-defined period. Management typically also agrees to purchase warrants at the strike price in a private placement a year after the IPO to provide liquidity. Unit IPOs are typically associated with less prestigious underwriter's (Schulz, 1993). Chemmanur and Fulghieri (1997) show evidence that firms with more intrinsic risk are more likely to choose unit IPOs over standard equity IPOs. Schultz (1993) also presents the *agency-cost hypothesis*, which states that a unit IPO "provides management incentives to prove a project's value before obtaining a second round of financing".

The management team and possible financial sponsors typically retain 20% of the shares at the IPO with only a marginal amount of capital invested in the SPAC. However, the original shareholders are not entitled to any funds in the event of liquidation as all assets (net of

5 http://www.ibtimes.com/articles/20080306/nyse-moves-to-allow-spac-listings.htm

possible small liabilities) in trust fund or owned by the SPAC are returned to investors holding shares issued in the IPO.

Underwriters of the IPO charge a median underwriter's fee of 7 % as has become the market convention in all medium-sized US IPOs (see e.g., Chen and Ritter, 2000; Hansen, 2001). However, SPAC underwriters typically agree to defer a portion of the fee until a merger has been completed. This deferral includes also waiving rights to the interest accrued on the deferred funds from the pre-acquisition period. The payment of the deferred portion is contingent on the completion of a merger. Contingent fee structures have received some attention in the academia. Rau (2000) finds that the size of the fee contingent on completing a M&A is positively correlated with the market share and number of deals advised by the bank and that there is significant evidence of negative correlation between the acquirer's post-acquisition share price performance and the contingent fees charged. Rau (2000) concludes that contingent fees are suited to align the interests of the advisor and the acquirer to complete a tender offer, but also that banks behaviour is opportunistic and not in line with the long term interests of the acquirer shareholders. The usage of fees based on meeting certain criteria has also been thoroughly studied in the legal realm where lawyers' efforts are often tied to the outcome of the court's ruling. McKee et al. (2007) present that an equilibrium contingent fee may exist to optimize agency costs and improve the expected value of the outcome, but require sufficient sophistication on behalf of both parties involved.

2.4.3. Post-IPO period – Seeking target companies

SPACs seeking acquisition targets are quite illiquid and among the least traded equities on any exchange. However, in comparison to private equity, this limited liquidity still provides an additional method to exit the investment and allows investors to use more dynamic exit strategies. The illiquidity of a security carries some implications regarding the future development of its price. Several studies (see, e.g. Amihud and Mendelson, 1989; Amihud, 2002; Lerner and Schoar, 2004) show that illiquid securities carry a discount and therefore experience higher abnormal returns at the time of positive news as the discount shrinks.

SPAC managers typically do not allocate their full time in seeking acquisitions but have limited their duty to even as low as only 10 hours a week. However, aligning management

and underwriter interests with a deferred underwriter's fee also harnesses the underwriter to assist in the search of an acquisition target (Rau, 2000).

The pre-merger trading of SPAC shares has been documented to experience some anomalies, namely the discounted price of the shares relative to the net asset value (NAV) presented by the value of funds placed in the trust fund. These anomalies can be viewed from the framework of closed-end fund valuation as both SPACs and closed-end funds share similarities in vehicle characteristics and typical share price development. Closed-end funds are typically found trading at prices below the net asset value of the vehicle. This phenomenon is part of the *closed-end fund discount puzzle*[6] and has been studied extensively, but arguably not conclusively (see e.g., Zweig, 1973; Delong et al., 1990; Lee et al., 1991). The puzzle has been partly explained by agency costs, illiquidity, taxation and investor sentiments. The agency costs explanation is first introduced by Boudreux (1973) who proposed that discounts may result from high management fees or subpar expected portfolio management. However, aspects of the agency costs explanation has been disputed by various studies (see e.g., Malkiel, 1977; Lee et al., 1991) and are not accepted as a relevant explanation to the puzzle. Portfolio asset illiquidity, on the other hand, has received acceptance as carrying some credit in explaining the discount (Malkiel, 1977; Lee et al., 1991), but failing under closer scrutiny to explain the fluctuations in the level of discount. Capital gains taxation argument has received contrary evidence from Brauer (1984) and Brickley and Schallheim (1985) who present evidence that the dynamics of a closed-end fund's share price development in the event of conversion to an open-ended form are that of rising share prices matching NAV instead of NAV depreciating to the level of the share price. Changing investor sentiments is the single most acceptable explanation the *closed-end fund puzzle* (Lee et al., 1991).

Although SPACs differ greatly from closed-end funds as investment vehicles, some parallels can be drawn between the SPAC merger completion and the open-ending of a closed-end fund. Based on evidence from closed end-funds it is expected that SPAC share price also exhibits similar behaviour in the merger completion event.

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[6] The closed-end fund discount puzzle consists of four aspects: (i) discount share price, (ii) fluctuation of the discount level, (iii) positive abnormal returns when closed-end fund is convert to open-ended and (iv) the reason why the funds initially get started.

2.4.4. Merger agreement and shareholder vote

When a target company is found a letter of intent to merge is signed and announcement of this agreement is made. Voting schedule and instructions for the shareholders is will also be decided at this time. The date for the special shareholder meeting where the voting takes place is typically set 4-12 months after the announcement to allow for a road show to market the proposed target company to current and potential shareholders. During the period leading to the shareholder's meeting details of the transaction are agreed upon and all preparations made to allow for completion of the merger just days after SPAC shareholders have approved it.

Shareholders choosing to vote against the merger are entitled to convert their shares to cash by liquidating their pro-rata share of the funds in the escrow account including any accrued interest. If the number of shareholders converting their ownership exceeds the set threshold, the proposed merger is abandoned and the SPAC moves to the liquidation process.

2.4.5. Merger

If the required level of shareholder approval is met, the proposed merger proceeds as prepared. An official announcement of merger approval is made immediately following the shareholder's meeting. The merger taking place is a reverse merger where the existing shareholders of the target company are paid new shares of the SPAC, cash or a combination of the two. The resulting entity is a public company with operations of the acquired target and a shareholder base depending on the fraction acquired. The finalisation of a merger is dependent only on relevant filings and transactions and is completed typically within 2-3 days of the shareholder vote.

Reverse mergers have been studied very little, but the general consensus in the academia as well as in business world is that reverse mergers are a "back door" for going public. Typically a reverse merger is carried out with a small shell company and allows the registrant to escape various listing requirements, which is why higher quality companies typically do not consider reverse mergers as feasible alternatives and choose to go public via an IPO (Bayar and Chemmanur, 2006; Gleason et al., 2006). The argument presented for reverse

mergers is that they allow smaller companies to cheaply gain public status and thus access public equity markets. However, one must note that a reverse merger by definition does not include additional financing for the company. Arellano-Ostoa and Brusco (2002) show in their unpublished working paper that an IPO and a reverse merger with a seasoned equity offering are approximately of equal cost, but emphasize that companies choosing reverse mergers are not likely to subsequently raise capital. Sjostrom (2006) argues that reverse mergers serve primarily the purpose of allowing small companies to access PIPE financing.

2.5. Issues to consider

This section describes the advantages and disadvantages for investors and target companies involved in a SPAC IPO or merger.

2.5.1. Advantages for investors

SPACs combine several features that help explain the demand for SPACs. The combination of access to private markets, limited downside and the existence of secondary market make SPACs a unique vehicle in the financial markets. As an investment vehicle, SPAC fundraising via an IPO is a quicker process than private equity fundraising, allowing for a swift turnover of invested funds.

SPACs allow investors to invest in a private sector companies just like private equity funds, but offer several advantages over private equity. These advantages include greater transparency due to SEC regulation, a clearly defined and low maximum risk due to mimicking the Rule 419 compliant use of an escrow account, and a relatively short investment period, that can even be aborted by selling the shares on the exchange or choosing to convert them at the time of shareholder voting on the proposed merger.

Further advantages stem from corporate governance issues as private sector companies are often owned by a low number of shareholders. When such companies are taken public the original ownership base often results in blockholders owning a relatively large share of the public company's shares. These blockholders then increase the level of shareholder control in the company and improve corporate governance practises. (Shleifer and Vishny, 1986)

2.5.2. Advantages for target companies

Solid markets for SPACs could not exist unless SPACs also offers benefits to target company shareholders and managers. SPAC's key target profile is companies looking to go public in near future or at least open to the possibility. Alternatives to going public first include the choice of an IPO or an acquisition by an already public entity.

Assuming that the target company is not willing to merge with another operating entity, SPACs offer a way to carry out a reverse merger, but also gain benefits of funds raised in the SPAC IPO. Plain reverse mergers are typically only a way to change to a public status, but very little capital changes hands in these transactions. Arellano-Ostoa and Brusco (2002) show that standard reverse mergers and IPOs are equal in cost when taking into account the lack of additional funding in reverse mergers.

Based on the issues presented above, going public through a reverse merger with a SPAC may offer a feasible solution to both the shareholders of the SPAC and the target company. Assuming that the future public status of the target enables SPAC to value the target beyond what financial acquirers in the private sector are able to. If this valuation remains below the expected premium from the newly acquired public status, the scenario is a presents a potential win-win situation for the shareholders of both companies.

SPAC is also a feasible vehicle for the target company to undergo a reverse merger with as it is a clean shell without hidden liabilities. Compared to standard reverse mergers, merging with a SPAC does not carry a similar reputation risk as SPAC is a legitimate financial acquirer.

2.5.3. Disadvantages for investors

Disadvantages inherent in SPACs are distinct and identifiable. However, the implications for investors are less obvious and make SPAC valuation a difficult task. The inherent dilution from original shareholders, the difficulty of evaluating management competence beforehand,

competition with private equity, and finally a lemons problem may also arise due to target companies' preferences of route to going public.

Management and the financial sponsors of the SPAC typically invest as little as 2 cents per share, but retain an ownership of 20 % in the company (Jog and Sun, working paper, 2007). This results in a respective dilution when a merger is approved and all shares start trading on equal basis.

Like private equity, SPACs rely heavily on the competence of the management team. SPAC management uses their connections and industry knowledge to identify potential acquisition targets. Competence in this process is difficult for investors assess. In addition, management's duty to work for the SPAC is usually a very limited time per week, decreasing management's expected effort for finding a target.

Competition with private equity is a crucial element to account for. Especially LBO funds in the small and mid-sized bracket compete for target companies with SPACs, although the target profile slightly varies between the two: SPACs aspire to merge with target companies that can be acquired at a discount and are willing to immediately go public. Buyout funds' key focus is finding companies that benefit from restructuring to increase value (Nadant et al., 2006). Competitive and well established private equity markets decrease the probability of finding and closing mergers with high quality targets.

Another problem regarding high quality target companies is their preference to go public via an IPO (Bayar and Chemmanur, 2006). This creates potential for a lemons problem in a market where top companies go public themselves or are acquired by well-established private equity funds.

Information asymmetries are also a problem during SPACs existence. For example, Pink Sheets OTC Markets do not require companies to be reporting of insider trading, unlike OTCBB and larger exchanges. And even after completing a merger the asymmetries remain high due to the lack of analyst coverage on the new public entity and its operations.

SPACs have started out as niche vehicles and this is also reflected on the quality of the promoters. SPAC IPOs are often underwritten by smaller banks that may lack the

connections and clientele to market the SPAC and assure investor attention in the post-merger period. This relates also to the problems arising from of lacking analyst coverage mentioned in the next section.

Finally it must be noted that investing in SPACs requires eventually an active role when the management team presents their proposed merger deal. To successfully invest in SPACs requires research on the proposed merger. Screening the investments which to approve requires resources, but passive investment strategy leads to worse returns. The option for an individual investor to convert her shares into cash is a highly valuable privilege and should not be ignored.

2.5.4. Disadvantages for Target Companies

Disadvantages for target companies are few. A company willing to go public should find little difference to alternatives after a merger with a SPAC. Consistent with Bayar and Chemmanur (2006), SPACs have been experiencing volatile post-IPO share price performance, which has received some critique in media and among investors. Reverse mergers in general result in listed companies that lack analyst coverage. This further increases the information asymmetries among investors.

However, after a company has established its public status and gained analyst coverage, the fact that it merged with a SPAC to become publicly listed bears little consequence.

3. Review of relevant literature

Blank check companies have so far been neglected in the academia, and no studies focusing on blank check companies have been published[7]. The following sections include a brief review of literature relevant to SPACs.

3.1. Theories on value creation

SPACs are financial acquirers and, as such, are in the business of creating value through screening of potential acquisition targets and closing deals with advantageous terms. Neoclassical – or value creation – theory sees acquisitions as value-enhancing activities where managers work to maximize stockholder wealth. This value creation may arise from various sources, such as cost cutting or corporate restructuring. However, most of the existing literature focuses on how strategic acquirers can create value. On the other hand, studies on financial acquirers have mostly focused on private equity funds. Investments by private equity differ from those of SPACs in a crucial way: private equity funds not only invest capital, but also human resources. Private equity funds thus actively pursue value creation methods while owning the company. SPACs, on the other hand, are fairly limited in their selection of value creation methods as the deal is a one-off type investment implying that the value must be created within the terms of the merger.

Neoclassical theories propose several ways of value creation. These include efficiency improvements (Weston et al., 2001), increased operational synergies (see e.g. Weston et al., 1998), financial synergies (Myers and Majluf, 1984), strategic realignments (Copeland and Weston, 1988), undervaluation, asymmetric information (Bradley et al., 1983), and diversification. The following sections focus on literature regarding value creation methods feasible for SPACs.

[7] As noted in Chapter 1, a working paper on blank check IPOs by Jog and Sun (2007) is available and is the only study found that studies blank check companies

3.1.1. Undervaluation

The undervaluation theory originates from the assumption of inefficient markets. Acquisitions are made where the market value of a company does not reflect its true intrinsic value. A low q-ratio is regarded as an implication of undervaluation. Q-ratio is defined as the ratio of the market value of a company to the replacement cost of its assets. A company with a low q-ratio is an attractive target for a takeover as it can be acquired at a lower cost compared to other means of developing similar assets. The q-ratio is typically regarded as a sign of company's growth opportunities and/or goodwill.

Problem with undervaluation from SPAC's perspective is that they focus on private companies which do not have a quoted market value. Private companies are difficult to value due to lack of transparency required from public companies. This presents a dilemma for SPAC management as the resulting scenarios are that either a competing acquirer is targeting the same company, which pushes the price up and reduces acquirer returns (see, e.g. Bradley et al., 1988) , or the management and shareholders of the target company find the offer reasonably priced. This situation leads us directly to *the winner's curse* (see, e.g. Thaler, 1988) which refers to the phenomenon where the "winning" or accepted bid is the one most likely to overvalue the goods or assets for sale.

To understand how challenging value creation with is even with a full arsenal of tools at disposal, we can look at Sirower (1997) who summarized the results of ten empirical studies documenting the "value-destructive effects of acquisitions to the shareholders of acquirers". Event window was restricted to the announcement period and the negative abnormal returns for acquiring companies range from -3.35 % to -0.8 %. On average, only 35 % of the merger announcements were met with positive return performance. These results seem to contradict the findings by Jensen and Ruback (1983) where immediate returns were positive for the acquirer. Most of the studies quoted by Sirower (1997) focus on the M&As completed in the 1980's whereas Jensen and Ruback (1983) focus is on mergers in the 70's. To show that M&A performance is getting worse, Sirower (1997) quotes four different studies indicating that returns to acquirers were in fact lower in the 80's than they were in the 70's. Which, in turn, were lower than bidder returns in the 60's.

3.1.2. Asymmetric information

Over time, a myriad of studies have shown that takeovers of publicly traded targets are value neutral at best, although likely to destroy bidder shareholder value. However, contrary evidence from studies focusing on acquisitions of privately held targets has been documented in the past ten years (see, e.g. Chang, 1998; Fuller et al., 2002; Faccio et al., 2006). Rationale for the positive returns to bidders targeting private targets has been given several explanations. Part of the effect is credited to the presence of blockholders who improve shareholder control in the company (see e.g. Shleifer and Vishny, 1986), but also give a positive signal by keeping a large position in the company yet being well-informed (Leland and Pyle, 1977; Chang, 1998). Another view on the issue comes from Bayar and Chemmanur (2006) who examine the choices of going public in the context of partially exiting venture capitalist. In their theoretical paper Bayar and Chemmanur (2006) propose that while an IPO would yield higher returns a company might choose to be acquired at a lower price due to benefits arising from synergies in certain product market related scenarios. It can be argued that markets perceive that a public acquirer has gained the "listing premium" while paying a premium-free price for the target assets. Bayar (2006) set out to find empirical evidence on the implications of the framework presented by Bayar and Chemmanur (2006) and finds the premium to disappear for deals over $50 million in size and in general diminish over time. Brau et al. (2003) propose that the premium may actually be a liquidity discount: merging with an established public entity allows for better liquidity than being listed as a new public company. As a final explanation, Bayar and Chemmanur present that the entrepreneur may choose to be acquired as information asymmetries among IPO investors are large and cause fluctuating share prices. This presents a risk for the share price to sink below the price offered in the M&A deal before a possible lockup period is over.

3.1.3. Corporate governance

As suggested in previous section, SPACs have some means to extract value from improving control over management. In addition to the aforementioned blockholders, who mostly create value relative to other public companies, SPACs can also employ debt financing to acquire the target, thus increasing its leverage. Increasing the leverage of a company has been shown to reduce possible agency problems between management and shareholders. This effect is

referred to as *free cash flow hypothesis* (Jensen, 1986). The agency problem in this context arises when management is not entitled to the full amount of residual claim a company creates and, instead of focusing on value creating activities, are tempted to invest less effort in managing the company and more in consummation of perquisites, empire building and other value destroying activities. Increasing the level of debt in a company reduces the free cash flow the company generates, thus decreasing management's opportunities to squander it in value destroying activities. Debt can thus be seen as a tool to improve control over management.

Agency problems and other challenges found in SPACs are discussed in section 3.2.

3.1.4. Method of payment

Closely related to the topics of debt and information asymmetries is the question of acquisition currency, i.e. choosing between cash or stock. Myers and Majluf (1984) argue that the acquirer prefers cash if the management believes their stock is undervalued. From these propositions arises the *signalling hypothesis*, which states that using cash to finance the acquisition implies that management's perceives that their stock is undervalued. It follows that using company's stock to pay the target signals undervaluation. The signalling hypothesis has received support from several studies such as Huang and Walkling (1987), Travlos (1987), and Loughran and Vijh (1997) who all find higher returns for both bidder and target when acquisition is financed with cash rather than stock. Part of the superior performance of cash deals, however, is attributed to the benefits of debt. Maloney et al. (1993) find in their analysis of leverage and announcement-period returns to acquirers that returns to acquirers are positively correlated with the pre-acquisition level of debt and post-acquisition changes in leverage. Their findings are consistent with Jensen's (1986) *free cash flow hypothesis* which proposes that debt can be used as a control mechanism on the management, thus improving corporate governance practises in the company.

In acquisitions of privately held targets, Chang (1998) finds stock deals to result in positive reactions in acquirer's share price. Several other studies (see, e.g. Travlos, 1987) document the exact opposite for acquirers of public companies. The negative reaction for acquisitions of public targets is typically perceived as the inverse of the *signalling hypothesis* presented earlier regarding cash deals; stock is used when management believes it is overvalued. Thus,

markets correct their valuations downwards at times of announced stock deals. The explanations to positive reactions for acquirers of private targets were already discussed in section 3.1.2, but the matter of payment method is yet to be touched on the issue. Officer et al. (2007) show in their unpublished working paper that acquirers using stock as the acquisition currency are rewarded "when the target's assets and operations are difficult to value". This is consistent with Hansen's (1987) model of bargaining under asymmetric information.

However, as non-operating financial acquirers SPACs have very little to signal in the first place. The method of payment is still a relevant issue not only due to the free cash flow hypothesis and use of debt, but also because the use of stock helps the acquirer to share the risk of overvaluation with the target company owners (Hansen, 1987). SPAC shares have a distinct intrinsic value as they represent a claim to what is essentially a trust fund, thus escaping the problem of valuing the share price fairly in negotiations with the target company.

3.2. Challenges faced by SPACs

3.2.1. Agency problems

Agency theory refers to the conflict of interest between the agent and the principal. Jensen and Meckling (1976) present two categories of conflicts found in companies; conflicts between shareholders and management and conflicts between shareholders and debt holders. Agency theory proposes that solution to the conflicts between shareholders and managers can be solved by increasing level of debt in the company. As discussed in previous section, debt is a viable tool to improve target company efficiency.

However, SPACs themselves are also subject to multiple sources of agency problems. The most obvious problem arises from the financial position of the management. Management stands to lose not only their tiny investment, but also the ownership in SPAC in case of liquidation. The limited timeframe in which to complete a merger is a prime source for an agency problem. As SPAC approaches the liquidation date the management has an incentive to propose any merger deal to the shareholders as it would still yield positive returns to management's original investment. Another source of an agency problem arises from a

similar situation. Due to the practise of deferring a portion of underwriter's fee, the underwriter also has an incentive to see a merger take place. As shown by Rau (2000), the underwriters play a role in finding target companies if a contingent fee is employed. This implies that also the underwriters have an incentive to have the SPAC complete any merger regardless of the deal quality. SPACs have artificially countered these problems with the Rule 419 compliant use of higher shareholder approval for the merger proposed by the management, which, in turn, has opened a door for activist funds to extract benefits with relatively low level of ownership.

3.2.2. Winner's curse

Bradley et al. (1988) studied the multiple bidders scenario and find that the net effect of a bidding contest is decreased returns to acquirer shareholders. In the single bidder scenario the abnormal returns were positive at 2.8 %, while the returns to the acquirers in the multiple-bidder cases averaged at -0.7%. Evidence consistent with Bradley et al. (1988) is found in e.g. Servaes (1991) and Datta et al. (1992).

The evidence implies that as more bidders target the same company, the probability of falling victim to winner's curse increases. SPACs by definition are in competitions with private equity funds as they both target privately held companies. Although a SPAC is unlikely to participate in a bidding contest on a single target, competing acquirers targeting companies with similar profiles are likely to decrease SPAC shareholder value.

The threat of winner's curse not only arises from the competition, but also from the target companies. Bayar and Chemmanur (2006) argue that companies of higher quality prefer going public via an IPO to gain sufficient underwriter support in creating liquidity. Brau et. al. (2003) address this decision making process and find that decision to undergo an IPO is more likely under macroeconomic conditions such as high cost of debt and "hot" IPO market, whereas less active IPO periods often yield lower valuations, thus appearing less enticing for companies to go public via an IPO. The factors affecting a private company's decision to go public are of immense relevance to investors in SPACs as they also allow for evaluation of the current operating environment: conditions unfavourable to IPOs are prime time for SPACs and vice versa.

4. Hypotheses

In this section I present the hypotheses of the study. The hypotheses are categorized by the source or reasoning they are based on.

4.1. Hypotheses based on earlier literature

Based on the efficient markets theorem (see, e.g. fama, 1970), I hypothesize that investors are informed and able to value the proposed mergers correctly, thus resulting in higher abnormal returns in the agreement announcement for the deals that are eventually completed compared to the whole sample.

H1: Abnormal returns in the merger agreement announcement event for the sample of completed mergers are higher than for the whole sample.

According Jensen's *free cash flow hypothesis,* debt financing can be considered an instrument of mitigation for the conflict between management and shareholders. This view is based on a two-fold reasoning: First, the higher the level of debt in a company is, the less the management has free cash flows to spend in perks or empire building. Second, the higher the profitability of a company is, the more free cash flows the management has as its disposal. Therefore shareholders can use debt financing to "hold management on a leash" and reduce the free cash flows available to them. Thus, in *H2* I hypothesise that transactions with higher leverage increase corporate governance and are more favourably received by investors.

H2: Abnormal returns in the merger completion announcement event are positively correlated with the level of debt used in the transaction.

At times of high cost of debt, high quality companies in need of financing are more likely to go public through an IPO to have better access to equity financing (Bayar and Chemmanur, 2006). High cost of debt also prohibits the extensive use of debt in the acquisition, which causes less net gain from the benefits of using debt to mitigate agency problems in the target company. Based on this I hypothesize that

H3a: Abnormal returns in the merger agreement announcement event are negatively correlated with the cost of debt.
H3b: Abnormal returns in the merger completion announcement event are negatively correlated with the cost of debt.

Earlier literature is contradicting when it comes to payment method and acquisitions of private targets. Officer et al. (2007) conclude in their unpublished working paper that positive abnormal returns to public acquirers of private targets are driven by the use of stock-swap as a method of payment in acquisitions of relatively opaque and speculative targets. This phenomenon was first documented by Chang (1998). Based on the research on acquisitions of private targets I hypothesize in *H4* that

H4: Abnormal returns in the merger completion announcement event are higher for deals that use stock as payment.

Studies by Amihud and Mendelson (1989), Amihud (2002) and Lerner and Schoar (2004) all show evidence that illiquid securities carry an illiquidity discount and are therefore subject to higher abnormal returns during positive events. I therefore hypothesize that less liquid SPACs experience higher abnormal returns during the event windows studied in this thesis.

H5a: Abnormal returns in the merger agreement announcement event are negatively correlated with daily trading volume.
H5b: Abnormal returns in the merger agreement announcement event are negatively correlated with daily trading volume.

Gompers and Lerner (2006) study how capital available to private equity funds affects the valuations of new investments. They find evidence for a positive correlation between the level of new funds inflow to venture capital funds and valuation levels of subsequent target companies. Based on this evidence I hypothesize that managers of larger SPACs also value their acquisition targets relatively higher than managers of smaller SPACs and therefore are more likely to overvalue their proposed mergers, thus resulting in winner's curse and worse share price performance.

H6a: Abnormal returns in the merger agreement announcement event are negatively correlated with the SPAC IPO gross proceeds.
H6b: Abnormal returns in the merger agreement announcement event are negatively correlated with the SPAC IPO gross proceeds.

4.2. SPAC specific hypotheses

As the liquidation date of a SPAC is fixed, the acquisition window available to the management team can be regarded as time value for finding suitable acquisition targets. It can be argued that an early acquisition announcement implies that, in management's opinion, the value of the proposed acquisition at hand exceeds the expected value they assign to the time left to find an acquisition target. Weaker returns for announcements of soon-to-be-liquidating SPACs could suggest the existence of an agency problem originating from the financial position of the management or from the interests of the underwriter trying to achieve her contingent fees.

H7a: Abnormal returns in the merger agreement announcement event are positively correlated with the time left in the acquisition window.
H7b: Abnormal returns in the merger completion announcement event are positively correlated with the time left in the acquisition window.

Typically in stock market based event studies the abnormal returns are found to accumulate in the pre-event period immediately before the event day. This may be interpreted as a consequence of insider trading or leakage of insider information. On the other hand, the pre-event abnormal returns may also be a reaction to public information that increases the probability of a transaction. In the case of a SPAC's announcement of merger completion, the information available to investors prior to the event is extensive and allows for a careful valuation of the deal. I propose that if a shareholder finds the merger favourable, she will expect other shareholders to hold the same view, thus reflecting on the share price before the announcement. On the other hand, information should not be available before the merger agreement announcement. SPACs are typically listed on exchanges with looser regulations especially regarding insider trading and disclosure, which I hypothesize that also leads to information leaks even before the merger agreement announcement event.

H8a: Pre-announcement abnormal returns start to accumulate prior to the merger agreement announcement.
H8b: Pre-announcement abnormal returns start to accumulate prior to the merger completion announcement.

Regardless of typically moving to larger exchanges with more liquidity when the merger is completed, the lack of analyst coverage on the new public company is not expected to attract immediate investor interest, as information regarding the company is scantly available. Thus, I hypothesise that the completion of a reverse merger has no imminent positive effect on the trading volumes of SPACs. I will test the changes in trading volumes in a separate t-test.

H9: Trading volumes do not increase immediately after a merger is completed.

I employ Rau's (2000) disposition that using contingent fees may drive banks to behave opportunistically. Based on this assumption I hypothesize that the deferred underwriter's fee is actually not good news for the SPAC shareholders, but in addition to being a contingent liability, contributes to lesser quality of acquisition targets, thus negatively correlating with the SPAC share price performance:

H10: Abnormal returns in the merger completion event are negatively correlated with the size of the deferred underwriter's fee.

As the final hypothesis of the study I propose that the management teams more confident in their ability to complete a merger accept higher percentages of IPO proceed to be placed in the trust fund. As shown by Jensen and Meckling (1976), the management of the company has superior information regarding the future investment opportunities. This could also hold for investment vehicles such as SPACs leading the management to signal their self-perceived competence with methods available. Thus, in *H11* I hypothesize that the level of IPO proceeds in the trust fund works as a proxy to SPAC quality

H11a: Abnormal returns in the merger agreement announcement event are positively correlated with the percentage of IPO proceeds placed in trust fund.

H11b: Abnormal returns in the merger completion announcement event are positively correlated with the percentage of IPO proceeds placed in trust fund.

Finally, Table 1 presents a summary of the hypotheses.

Table 1. Summary of hypotheses

The table presents the hypotheses of this thesis along with their identifying abbreviation, the methodologies used to study the hypotheses, the variables observed and the expected signs of the variables. In the method column ES denotes event study, REG, denotes ordinary least squares regression and SA denotes separate analysis.

Hypothesis		Method	Variable	Expected sign
H1	*Abnormal returns in the merger agreement announcement event for the sample of completed mergers are higher than for the whole sample*	ES	-	
H2	*Abnormal returns in the merger completion announcement event are positively correlated with the level of debt used in the transaction.*	REG	LEVERAGE	+
H3a	*Abnormal returns in the merger agreement announcement event are negatively correlated with the cost of debt*	REG	RISKFREE	-
H3b	*Abnormal returns in the merger completion announcement event are negatively correlated with the cost of debt*			
H4	*Abnormal returns in the merger completion announcement are higher for deals that use stock as payment.*	REG	PAYMETHOD	+
H5	*Abnormal returns in the merger agreement announcement event are negatively correlated with daily trading volume*	REG	TRADEVOL	-
H6a	*Abnormal returns in the merger agreement announcement event are negatively correlated with the SPAC IPO gross proceeds*	REG	SIZE	-
H6b	*Abnormal returns in the merger agreement announcement event are negatively correlated with the SPAC IPO gross proceeds*			
H7a	*Abnormal returns in the merger agreement announcement event are positively correlated with the time left in the acquisition window.*	REG	TIME	+
H7b	*Abnormal returns in the merger completion announcement event are positively correlated with the time left in the acquisition window.*			+
H8a	*Pre-announcement abnormal returns start to accumulate prior to the merger agreement announcement.*	ES	-	
H8b	*Pre-announcement abnormal returns start to accumulate prior to the merger completion announcement.*			
H9	*Trading volumes do not increase immediately after a merger is completed.*	SA	-	
H10	*Abnormal returns in the merger completion event are negatively correlated with the size of the deferred underwriter's fee*	REG	UWFEEDEF	-
H11a	*Abnormal returns in the merger announcement event are positively correlated with the amount of IPO proceeds placed in trust fund.*	REG	INTRUST	+
H11b	*Abnormal returns in the merger completion event are positively correlated with the amount of IPO proceeds placed in trust fund.*	REG	INTRUST	+

5. Data and Methodology

This section describes the data used in the study and presents the methodologies employed in the empirical part of the thesis. First, I describe the data sample, its characteristics and methods employed in obtaining the data. Next section discusses the methodology for calculating abnormal returns and cumulative abnormal returns. Finally, I define the regression model that is built to study the determinants cumulative abnormal returns.

5.1. Data description

The sample gathered for this study consists of 152 SPACs that have gone public in the US during the period starting January 1st, 2003 and ending February 28th, 2008 and are included in the Morgan Joseph Acquisition Company Index (MJACI) quoted by Bloomberg.

The share price and daily trading volume data is obtained from and Thomson Datastream database complemented by share price data available on the Pink Sheets website. All other information is gathered from the SEC Edgar database by manually reading SPAC filings, namely IPO prospectuses (Form 424b) and current reports filings (Form 8-K).

Table 2 summarizes the stages of the sample SPACs. The sample includes 152 companies of which ten have been liquidated after reaching the acquisition window deadline without shareholder approval for a proposed merger (each liquidated SPAC has proposed one merger to its shareholders), 48 have merged with a target, 72 are seeking acquisition and have yet to propose one, and 24 are in the process of waiting for shareholder approval to complete a proposed merger. 11 SPACs in the sample have been liquidated.

The SPACs included in the sample are listed on Pink Sheets OTC market or American Stock Exchange.

The market return benchmark used in this study is the Russell 2000 index, which is commonly used as the reference index for SPACs (see e.g. SPAC Analytics, Dealflow Media). The risk-free rate used in this study is the 3-month T-bills rate.

Table 2 presents the sample size distribution across the possible events during a SPAC's life cycle on February 28th, 2008 and the sample sizes for the studied events.

Table 2. Sample breakdown by phase

The table presents the sample size breakdown by current stage and event. The full sample size is 152 SPACs, but only 82 have announced a merger. Of those 82 48 have completed a merger, 11 have been liquidated and 23 are still in the merger process. However, the actual sample size is limited by the availability of data. Rightmost column provides the active sample size used in this thesis.

Sample distribution	In sample	Data available
Current stage		
Seeking acquisition target	70	70
Merger in process	23	22
Merger approved and completed	48	38
Liquidated	11	10
Event sample sizes		
Merger agreement announced	82	72
Merger approved and completed	48	38
Liquidation	11	10

The following section provides descriptive statistics on the sample of 152 US SPACs used in this study along with preliminary analysis. As SPACs are self-regulatory to a great extent, and free to adjust their restrictions to better suit the market demand, the following statistics are produced to document trends in SPAC characteristics.

Table 3 presents overview of characteristics of SPACs listed in Pink Sheets OTC market or American Stock Exchange during January 1st , 2003 – February 28th, 2008. From each section of the data we can see several trends emerging: (i) increasing mean sizes of SPACs, (ii) placing of 100% of IPO proceeds in trust fund, (iii) underwriter fees converging to 7%, (iv) increasing percentage of underwriter's fee payable after merger, and (v) increasing level of shareholder votes required to disapprove a proposed merger.

Increasing mean size and adjustments in handling of underwriter fees and IPO gross proceeds suggests that SPACs are maturing as an asset class. Investors' financial position has greatly improved judging from the mean values in 2004 to those of 2007. On average, per every $100,000 invested in 2007 an investor's guaranteed walk-away position has improved from a loss of up to $20,781 to a loss of up to $5,740, i.e. a from a return of -20.78% to -5.74%.

New asset classes with expanding markets also attract attempts to exploit any loopholes. In SPACs, one such loophole has been the shareholder approval vote, which has, consistent with Rule 419, traditionally required only 20% of votes to disapprove a merger. Several cases documented in 2006-2007[8] report an activist fund carrying out what later has been named "spacmail". In a spacmail attempt an activist fund acquires a block of SPAC shares required to disapprove the merger and threatens to vote against the merger unless management purchases the fund's shares at a premium. Later SPACs have fought this activism by increasing the typical level of the required vote to 30% and in some cases even beyond. Along with increasing sizes, the increased level of the votes required to disapprove has made it more difficult for spacmail to take place.

Table 3 presents statistics of the sample of SPACs used in this study. As an emerging phenomenon it is expected that the highest number of observations for full years is in the latest full year of the sample.

Table 3. Sample SPAC characteristics by year issued

Panel A: SPAC characteristics

Year Issued	N	Total	Min	Max	Mean	Median
SPAC IPO gross proceeds ($ '000)						
2003	2	51,246	24,150	27,096	25,623	25,623
2004	11	455,868	7,878	196,650	41,443	24,840
2005	28	2,098,551	15,250	188,675	74,948	54,600
2006	35	3,175,113	18,975	528,000	90,718	58,000
2007	65	11,033,670	28,750	552,000	169,749	107,779
*2008**	*11*	*3,383,363*	*41,400*	*920,000*	*307,578*	*200,000*
Whole sample	**152**	**20,197,811**	**7,878**	**920,000**	**132,880**	**80,000**
Underwriter fees in SPAC IPOs						
2003	2		10.00 %	10.00 %	10.00 %	10.00 %
2004	11		7.00 %	10.00 %	9.18 %	9.50 %
2005	28		5.00 %	9.50 %	7.58 %	7.25 %
2006	35		0.00 %	10.00 %	6.83 %	7.00 %
2007	65		3.25 %	10.30 %	7.00 %	7.00 %
*2008**	*11*		*5.75 %*	*8.00 %*	*6.77 %*	*7.00 %*
Whole sample	**152**		**0.00 %**	**10.30 %**	**7.25 %**	**7.00 %**
Shareholder merger disapproval voting threshold						
2003	2		20.00 %	20.00 %	20.00 %	20.00 %
2004	11		20.00 %	20.00 %	20.00 %	20.00 %
2005	28		20.00 %	33.00 %	20.46 %	20.00 %
2006	35		20.00 %	40.00 %	21.06 %	20.00 %
2007	65		20.00 %	40.00 %	28.21 %	30.00 %
*2008**	*11*		*30.00 %*	*40.00 %*	*33.03 %*	*30.00 %*
Whole sample	**152**		**20.00 %**	**50.00 %**	**30.05 %**	**20.00 %**

Year Issued	N	Min	Max	Mean	Median
Percentage of IPO proceeds (net of fees) placed in trust fund					
2003	2	85.00 %	85.00 %	85.00 %	85.00 %
2004	11	85.00 %	100.00 %	87.23 %	85.00 %
2005	28	86.00 %	100.00 %	90.91 %	90.35 %
2006	35	90.80 %	103.00 %	96.51 %	96.50 %
2007	65	95.00 %	100.00 %	98.32 %	98.50 %
*2008**	*11*	*98.50 %*	*100.40 %*	*99.74 %*	*100.00 %*
Whole sample	**152**	**85.00 %**	**103.00 %**	**95.66 %**	**97.60 %**
Percentage of underwriter's fee paid on completion of a merger					
2003	2	0.00 %	0.00 %	0.00 %	0.00 %
2004	11	0.00 %	0.00 %	0.00 %	0.00 %
2005	28	0.00 %	57.14 %	9.81 %	0.00 %
2006	35	0.00 %	75.00 %	31.48 %	31.00 %
2007	65	0.00 %	71.00 %	41.03 %	43.00 %
*2008**	*11*	*38.00 %*	*74.00 %*	*59.51 %*	*61.61 %*
Whole sample	**152**	**0.00 %**	**75.00 %**	**30.91 %**	**37.50 %**
Acquisition window length					
2003	2	720	1078	899.00	899.00
2004	11	720	720	720.00	720.00
2005	28	360	720	705.65	720.00
2006	35	540	720	709.71	720.00
2007	65	540	918	720.28	720.00
*2008**	*11*	653	1082	759.83	720.00
Whole sample	**152**	360	1082	719.67	720.00

[8] Dealflow Media, SPAC Report 1/2007

Panel B: Original shareholders ownership and investment

Year Issued	N	Min	Max	Mean	Median
Original shareholders ownership post-IPO					
2003	2	17.60 %	20.00 %	18.80 %	18.80 %
2004	11	0.01 %	21.70 %	18.34 %	20.00 %
2005	28	0.00 %	35.00 %	18.97 %	20.00 %
2006	35	0.00 %	26.67 %	18.94 %	20.00 %
2007	65	17.90 %	22.01 %	20.15 %	20.00 %
*2008**	*11*	*20.00 %*	*20.00 %*	*20.00 %*	*20.00 %*
Whole sample	**152**	**0.00 %**	**35.00 %**	**19.22 %**	**20.00 %**
Management warrant purchase committment					
2003	2	-	-	-	-
2004	11	-	-	-	-
2005	28	-	11,325	1,070	-
2006	35	-	8,254	1,697	1,020
2007	65	1,500	7,500	3,590	3,000
*2008**	*11*	*5,800*	*5,800*	*5,800*	*5,800*
Whole sample	**152**	**-**	**11,325**	**1,621**	**700**

Year Issued	N	Min	Max	Mean	Median
Management original investment					
2003	2	25	25	25	25
2004	11	1	25	23	25
2005	28	1	8,435	196	25
2006	35	1	8,435	384	25
2007	65	5	1,570	85	25
*2008**	*11*	*23*	*23*	*23*	*23*
Whole sample	**152**	**1**	**8,435**	**140**	**25**
Expected dilution to shares issued in IPO					
2003	2	17.50 %	19.91 %	18.70 %	18.70 %
2004	11	0.00 %	21.60 %	18.26 %	19.91 %
2005	28	0.00 %	34.99 %	15.82 %	19.95 %
2006	35	0.00 %	26.54 %	13.37 %	19.95 %
2007	65	0.00 %	21.99 %	7.71 %	0.00 %
*2008**	*11*				
Whole sample	**152**	**0.00 %**	**34.99 %**	**11.58 %**	**19.91 %**

Panel C: Trading and merger statistics

Year Issued	N	Min	Max	Mean	Median
Average daily trading volume					
2003	2	38.487	39.707	39.097	39.097
2004	11	4.224	284.357	63.554	28.493
2005	28	1.022	1,963.488	89.737	28.440
2006	35	1.022	1,963.488	104.188	21.216
2007	65	11.119	561.109	67.591	40.190
*2008**	*11*	*18.590*	*1,954.555*	*402.283*	*116.635*
Whole sample	**152**	**1.022**	**1,963.488**	**96.788**	**37.003**
Days between IPO and merger completion					
2003	2	365	1,349	857.00	857.00
2004	11	250	753	603.00	715.00
2005	28	302	882	621.80	656.00
2006	27	302	723	524.00	546.00
2007	14	226	282	245.00	227.00
*2008**	*0*	*N/A*	*N/A*	*N/A*	*N/A*
Whole sample	**82**	**226**	**1,349**	**604.88**	**653.00**

Year Issued	N	Min	Max	Mean	Median
Leverage used in transaction					
2003	2	306.01 %	307.87 %	306.94 %	306.94 %
2004	9	0.00 %	316.67 %	97.14 %	58.82 %
2005	28	0.00 %	544.59 %	69.84 %	0.00 %
2006	27	0.00 %	544.59 %	87.56 %	42.32 %
2007	14	8.21 %	290.13 %	149.17 %	149.17 %
*2008**	*0*	*N/A*	*N/A*	*N/A*	*N/A*
Whole sample	**80**	**0.00 %**	**544.59 %**	**87.96 %**	**8.21 %**
Days between merger agreement and completion or liquidation					
2003	2	171	455	313.00	313.00
2004	11	167	331	236.89	233.00
2005	28	83	575	248.57	226.00
2006	27	83	394	229.00	226.00
2007	14	94	199	147.00	148.00
*2008**	*0*	*N/A*	*N/A*	*N/A*	*N/A*
Whole sample	**82**	**83**	**575**	**242.84**	**221.00**

*Denotes an incomplete sample year

5.2. Event study methodology

The event study method is used to calculate abnormal returns and cumulative abnormal returns. The event study methodology is applied on two expected events per sample company:

1. The announcement of an merger agreement with a target company
2. The announcement of completion of the merger

The daily returns for SPAC shares are calculated as logarithmic price relative as follows.

$$R_{it} = \ln \frac{C_t}{C_{t-1}} \qquad (1)$$

Where R_{it} is the return of a security i at time t, C_t is the closing price of the share i at time t, and C_{t-1} is the closing price of the share i at time t-1.

5.2.2. Estimating the normal share price performance

The following sections discuss the methodologies selected to measure the normal share price performance in the merger announcement and merger completion events.

As SPACs have no cash-flow generating operations, their pre-announcement share value can be argued to consist of a combination of the amount of funds in trust per share, which provides the lower limit for the value and the expected value added by the potential upcoming merger. The expected value of a future merger can be considered consisting of three variables: (i) general market conditions, (ii) management competence, and (iii) time value (i.e. time until liquidation). Market conditions are an unpredictable factor and can be considered part of the disturbance term of the model. Management competence, on the other hand, is constant assuming an unchanged management team. Time until liquidation is a predictable factor that sets lower limit of zero for the value added by the potential merger as SPAC approaches its liquidation deadline.

Based on the facts presented above, I choose to use the constant mean return model as a method of measuring the performance of the share price at the merger agreement announcement event. The constant mean return model is

$$R_{it} = \mu_i + \varepsilon_{it} \qquad (2)$$

Where R_{it} is the daily return of security i at time t, μ_i is the mean return for security i, and ε_{it} is the disturbance term for security i with an expectation of zero and variance σ_{ξ}^2.

The abnormal returns in the merger completion announcement event are derived using a standard (single index) market model as suggested by e.g. Fama (1973). The reasoning behind alternate method compared to the announcement event is twofold; first, the SPAC is

now linked to an operating business entity that is subject to fluctuations in market conditions and can be valued with traditional valuation tools. Second, there now exists a second likely outcome in addition to the liquidation, which is also more probable to take place. Under these conditions, it is less justified to use the constant mean model but more so to employ the single index market model.

The market model assumes a linear relation between the return of a security and the market portfolio. According to the model, the return of a stock can be written as

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it} \tag{3}$$

where α_i is the expected value of the component of security i's return that is independent of the market's performance – a random variable, R_{mt} is the rate of return on the market index, also a random variable, β_i is a constant of the expected change in R_{it} given a change in R_{mt}, and ε_{it} is the unexpected component due to unexpected events that are firm specific (e.g. MacKinlay, 1997). By using Equation (4), the basic version of the market model is then estimated using the ordinary least squares (OLS) method. OLS method assumes that asset returns are jointly multivariate normal and independently and identically distributed through time. For the i:th firm in the event period, the OLS estimators of the market model parameters for an estimation window of observations are:

$$\hat{\beta}_i = \frac{\sum_{i=T_0+1}^{T_1} (R_{it} - \hat{\mu}_i)(R_{mt} - \hat{\mu}_m)}{\sum_{i=T_0+1}^{T_1} (R_{mt} - \hat{\mu}_m)} \tag{4}$$

$$\hat{\alpha}_i = \hat{\mu}_i - \hat{\beta}_i \hat{\mu}_m \tag{5}$$

For both the constant mean return model and the market model estimators for the mean return of security i is defined as

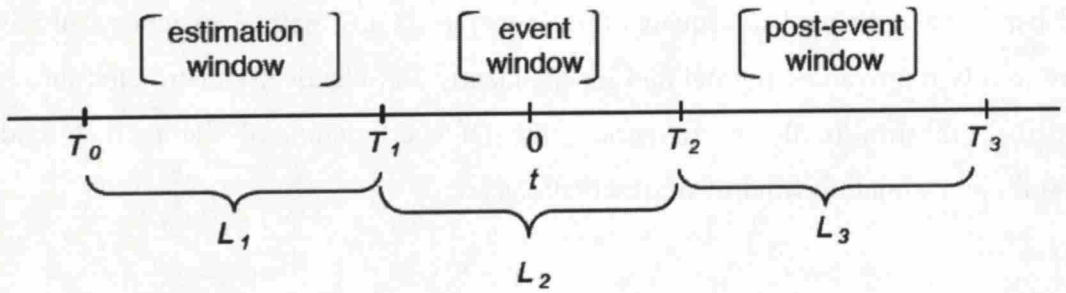
$$\hat{\mu}_i = \frac{1}{L}\sum_{i=T_0+1}^{T_1} R_{it} \tag{6}$$

and the mean market return is

$$\hat{\mu}_m = \frac{1}{L}\sum_{i=T_0+1}^{T_1} R_{im} \tag{7}$$

The definitions of T_i (i = 0…3) and L_i (i = 1…3) are depicted in Figure 1 where the estimation, event and post-event windows are illustrated.

Figure 2. Event study timeline



$t = 0$ is defined as the event date, $t = T_1 + 1$ to $t = T_2$ represents the event window, $t = T_0 + 1$ to $t = T_1$ constitutes the estimation window, and $t = T_2 + 1$ to $t = T_3$ depicts the post-event window. Let $L_1 = T_1 - T_0$, $L_2 = T_2 - T_1$, and $L_3 = T_3 - T_2$ be the length of the estimation window, the event window, and the post-event window, respectively.

Thus, the abnormal return for a security i on day t can be calculated with the constant mean model as

$$\varepsilon_{it} = AR_{it} = R_{it} - \hat{\mu}_i \tag{8}$$

And with the market model as

$$\varepsilon_{it} = AR_{it} = R_{it} - \left(\hat{\alpha}_i + \hat{\beta}_i R_{mt}\right) , \qquad (9)$$

where R_{it} is the observed continuously compounded return for security *i* on day *t*.

Assessment of the relationship between transactions and stock market returns is carried out with standard methodology for event studies as firs presented by Ball and Brown (1968) and Fama et al. (1969). For reference, Elton and Gruber (1995) provide a clear presentation of the aspects of the event study method and MacKinlay (1997) discusses the various statistical problems in event studies.

First, the event period is determined and normal returns are defined. The event period (L_2) used is 20 days prior to and 20 days after the event. Abnormal returns are calculated for each day during the event period. Cumulative abnormal returns are also calculated for the period with various intervals. Normal return is defined as a security's expected return under normal conditions, i.e. when no event takes place. As mentioned earlier, in this study the daily abnormal returns are generated employing a constant mean return model for the announcement event and the standard (single index) market model for the merger completion event. An estimation window (L_1) used in this study includes 50 trading days – from day -70 to day -21 - before the event and models for both events are then estimated using the ordinary least squares (OLS) method to calculate the parameters necessary for both models (R_{it} , R_{mt} , α_i , and β_i). The short length of the applied estimation window (L_1) is due to two issues. First, the share price data is rather limited and extending the evaluation period to standard 200 days was ruled out for lack of data. Second, the shorter period is not expected to provide problems as SPACs trade very little and the movements in the share price are near negligible prior to the merger announcement.

The next step is to estimate abnormal returns *(AR)* on day *t* for a given security. The residual term (ε_i) from the market model is used to measure risk-adjusted abnormal return (see Equation 8). The average abnormal daily returns on a portfolio of stocks at any time *t* relative to event day equals:

$$\overline{AR_t} = \frac{1}{N}\sum_{t=1}^{N} \varepsilon_{it} \tag{10}$$

where N is the number of observations in the sample and ε_{it} is the abnormal daily return on security i on day t. The cumulative abnormal return *(CAR)* at time t relative to time t_0 is computed as:

$$\overline{CAR}(t_0, T) = \frac{1}{N}\sum_{t_0}^{T} \overline{AR_t} \tag{11}$$

A t-test is used to assess the statistical difference of abnormal returns, Assuming security's daily abnormal returns are independently and identically distributed, portfolio daily abnormal returns approach normal distribution for large samples under Central Limit Theorem (e.g. Elton and Gruber, 1995).

$$t_{AR} = \frac{\overline{AR_t}}{\hat{\sigma}\left(\overline{AR_t}\right)} \sim t(N-1) \tag{12}$$

which is distributed Student-t with 49 degrees of freedom (estimation period is N = 50 days) for the assumed normal and independent ε_{it} and where $\hat{\sigma}\left(\overline{AR_t}\right)$ is the sample standard deviation of the portfolio returns during the estimation period over the 50 days, -70 to -21, calculated as:

$$\hat{\sigma}\left(\overline{AR_t}\right) = \sqrt{\frac{\sum_{-70}^{-21}\left(AR_t - \overline{AR_t}\right)^2}{49}} \tag{13}$$

where $\overline{AR_t}$ is the average portfolio abnormal return during the estimation period. In order to test whether the cumulative abnormal return from day t until $t + n$ is significantly different from 0, a t-statistic is computed:

$$t = \frac{CAR_t^{t+n}}{\sqrt{n} \times \hat{\sigma}\left(\overline{AR_t}\right)} \tag{14}$$

where n is the number of days in the event window and $\hat{\sigma}\left(\overline{AR_t}\right)$ is the sample standard deviation of the portfolio abnormal returns as above.

5.3. Multivariate regression model methodology

To better understand which characteristics of a SPAC drive the performance of the share price during the merger announcement and merger completion I build a regression model. The aim of the model is to find any characteristics of SPACs that contribute to the performance of the share price and can be quantified and evaluated before a merger announcement is given.

The dependence between SPAC CARs and the independent variables in the common multiple OLS model is defined as:

$$CAR_i = \alpha + \beta_1 x_1 + ... \beta_k x_k + \varepsilon_i \ , \qquad (15)$$

where the dependent variable is CAR_i, the average cumulative abnormal return for company i, α is a constant, $x_1 ... x_k$ are the examined independent variables and $\beta_1 ... \beta_k$ are regression coefficients. ε_{it} is a residual term with an expected mean of zero. To test the hypothesis concerning a variable's coefficient, its statistical significance is studied by using a standard two-tailed t-test.

Thus, I build a regression model that is developed to estimate the influence of the selected explanatory variables on the dependent variable (abnormal returns). I hypothesize that 13 factors could explain the occurrence of abnormal returns. These are detailed in the next section

5.3.1. Independent variables

Reasoning for each variable included in the regression analysis is presented in this section along with the expected sign.

SPAC IPO gross proceeds (LN SIZE; -)

The amount of funds raised by a SPAC in an IPO obviously allows for a greater base of potential acquisition targets. Although SPACs comply to Rule 419 with regards to the minimum fair market value of the net assets to be acquired being at least 80 % of the proceeds from the IPO, it is follows that potential for overvaluation exists, but undervaluation is unlikely as target shareholders will not approve undervalued offers. Gompers and Lerner (2000) study the effect of additional funds available for investments in the private equity realm and find evidence of positive correlation between funds available for investment and valuations of target companies.

Time until liquidation date (LN TIME; +)

Time until liquidation is included in the independent variables primarily based on the agency theory. Management's compensation structure typically found in SPACs is a hotbed for agency-motivated acquisition attempts. Management along with any financial sponsors of the SPAC typically hold 20 % of shares post-IPO, but aren't entitled to any compensation if merger does not take place and the SPAC is liquidated. I argue that this motivates the management to eventually push for approval of virtually any acquisition, as it is better than admitting defeat and losing any possibility of the huge returns as documented by Jog and Sun (2007).

Second argument for including the relative time of merger agreement announcement as a variable is that the time left until the date of liquidation of the SPAC represents also time value for the expected quality of the proposed merger. A rational management team passes on potential targets if they believe that a higher quality target is likely to be found during the time left until the liquidation date.

To measure the relative time until liquidation I use the proportion of the acquisition window that is left at the time of the announcement.

Risk-free interest rate (RISKFREE; -)

The level of interest rates is a direct proxy for the cost of debt, which plays a crucial role in SPAC ability to create value. Higher cost of debt restricts use of debt in the merger, which in turn restricts the ability to benefit from reducing agency costs as proposed by e.g. Jensen (1986).

Leverage used in the transaction (LEVERAGE; +)

Leverage is measured as the relative cost of the acquired assets to the IPO proceeds. Leverage variable assumes for simplicity that no shares are converted in the merger approval process and that the whole amount raised in the IPO is available for investment.

Leverage is expected to have a positive sign in accordance to free cash flow theory.

Percentage of IPO proceeds placed in trust fund (INTRUST; +)

Although market conventions have highly affected the development of the amount of IPO gross proceeds that are placed in a trust fund, I argue that the percentage of funds placed in trust at offer signals management's confidence in themselves to find a target that will gain sufficient shareholder approval. The percentage of IPO proceeds in trust fund can then be considered as a proxy for the quality of the SPAC.

Expected dilution from the original shareholders shares (DILUTION; -)

The management team typically retains 20 % of the shares in the SPAC. The amount of capital invested in the SPAC by the management is usually only $25,000. Until a merger is completed, the management is not entitled to any compensation based on their ownership or otherwise. At the moment of the merger completion the ownership of SPAC shareholders is diluted by the amount of the management's ownership. The expected dilution is calculated as

$$DILUTION = 1 - \frac{SIZE - \left(SHARES\%_{Mgt} \times SIZE\right) + INV_{Mgt}}{SIZE}, \qquad (16)$$

where *SIZE* is the gross proceeds from the SPAC IPO, $SHARES\%_{Mgt}$ is the percentage of shares owned by the management team and the financial sponsors, and INV_{Mgt} is the amount of capital invested in the SPAC by the management team.

Underwriter's fee (UWFEE; +)

Underwriter's fee is the total percentage agreed to be paid to the underwriter's of the IPO. It includes the standard fee paid from IPO gross proceeds and the part that is paid only upon completion of a merger. Higher quality underwriter's are typically associated with higher fees, thus the expected sign is positive.

Deferred underwriter's fee (UWFEEDEF; +)

The part of the IPO underwriter's fee that is contingent on the SPAC's consummation of a target business may signal the underwriter's confidence in the management team to complete a merger. Bodnaruk et al. (2007) find in their unpublished working paper that investment banks involved in deals have superior information regarding the deal. If an underwriter agrees to defer a large amount of her fee it, can be interpreted as a signal of her confidence in the fact that the conditions for releasing the deferred portion of the fee will be met, i.e. a merger will be completed.

Average daily trading volume (TRADEVOL; -)

Trading volume is included in the list of variables as a proxy to liquidity. The illiquidity discount hypothesis states that illiquid securities are expected to experience higher abnormal returns at the time of positive news.

Industry focus (FOCUS; +)

Industry focus is included as a dummy variable. Industry focus is given a value of 1 if a SPAC's prospectus defines a specific industry or industries the management focuses on and have a person in the management team or as an advisor who has experience in that sector. Otherwise its value is 0. I expect the sign for *FOCUS* to be positive due to management's

expected superior knowledge on the chosen field of focus.

Method of payment (PAYMETHOD; -)

Method of payment is included as a dummy variable. The variable is given a value of 1 if a part or the whole merger is financed by issuing new equity to the shareholders of the target company. Otherwise its value is 0. Cash deals are shown to perform better mostly due to use of debt. Thus, I expect PAYMETHOD to carry a negative sign.

Approved merger (APPROVED; +)

Approved merger flag is included as a dummy variable. The variable is given a value of 1 if the SPAC eventually completed a merger. Otherwise its value is 0. I expect markets to efficiently value the announcements and value eventually completed deals higher than the whole sample.

SPAC liquidated (LIQUIDATED; -)

The liquidated SPAC flag is included as a dummy variable. The variable is given a value of 1 if the SPAC was not able to complete a merger and was liquidated. Otherwise its value is 0. I expect markets to efficiently value the announcements and value eventually disapproved deals lower than the whole sample.

Finally, Table 4 presents a summary of the variables and expected signs. The Pearson correlations are reported in Table 5.

Table 4. Summary of variables

Variable	Explanation	Expected sign
SIZE	SPAC IPO gross proceeds (net of fees).	-
LN TIME	Natural logarithm of number of days until the end of SPAC acquisition window.	+
RISKFREE	Annual average of three-month Treasury notes rate at the merger announcement year.	-
LEVERAGE	Leverage employed in the transaction	+
INTRUST	Percentage of shares placed in trust fund at IPO	+
DILUTION	Expected percentage of dilution at merger completion due to original shareholders shares	-
UWFEE	Total underwriter's fee (%) in IPO including any contingent portions.	+
UWFEEDEF	Underwriter's fee payable only at the completion of a merger.	-
TRADEVOL	Average trading volume ($)	-
FOCUS	Dummy variable with value 1 if SPAC focuses on specified industry or industries and otherwise 0.	+
PAYMETHOD	Dummy variable with value 1 is SPAC uses stock to finance part or whole of the merger and otherwise 0.	+
APPROVED	Dummy variable with value 1 if SPAC completed a merger and otherwise 0.	+
LIQUIDATED	Dummy variable with value 1 if SPAC is liquidated.	-

Table 5. Variable correlations

The table reports the Pearson's correlations for the variables in the regression analysis. Also reported is the number of observations and the statistical significances (p-value) of the correlations. The variables are defined as follows: TIME is the relative amount of time left in the acquisition window at the time of merger agreement announcement. SIZE is the amount of IPO gross proceeds. LEVERAGE is the relative size of the acquired assets to SIZE. INTRUST is the percentage of IPO gross proceeds placed in a trust fund. DILUTION is the dilution coming to effect at merger completion due to management owned shares. RISKFREE is the 3-month T-bills rate. INDUSTRY is a dummy variable with the value 1 if SPAC focuses on certain industry or industries and is 0 otherwise. UWFEE is the total underwriter's fee (%) in the SPAC IPO. UWFEEDEF is the underwriter's fee (%) that is paid only upon the completion of a merger. PAYMETHOD is a dummy variable with the value 1 if stock is used as a payment method in the merger and is 0 otherwise. APPROVED is a dummy variable with the value 1 if the SPAC has completed a merger and is 0 otherwise. LIQUIDATED is a dummy variable with the value 1 if the SPAC was liquidated and otherwise 0. For each coefficient, ***, **, and * indicate that the coefficient is different from zero at 1 %, 5 % and 10 % levels respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
(1) LEVERAGE	1												
Sig.													
N	49												
(2) INTRUST	-0.06	1											
Sig.	0.687												
N	48	152											
(3) DILUTION	0.177	-.480**	1										
Sig.	0.223	0											
N	49	152	153										
(4) RISKFREE	0.327	-0.086	0.025	1									
Sig.	0.103	0.444	0.825										
N	26	81	81	82									
(5) FOCUS	-0.21	0.107	0.128	0.05	1								
Sig.	0.156	0.315	0.231	0.729									
N	47	90	90	51	90								
(6) UWFEE	0.161	-.505**	.200*	0.027	-.235*	1							
Sig.	0.273	0	0.014	0.809	0.026								
N	48	151	151	81	90	152							
(7) UWFEEDEF	0.081	.637**	-.301**	-0.12	0.151	-.179*	1						
Sig.	0.58	0	0	0.284	0.156	0.028							
N	49	152	153	82	90	152	154						
(8) PAYMETHOD	-.340*	-.377**	.239**	-0.183	0.103	.186*	-.170*	1					
Sig.	0.017	0	0.003	0.099	0.336	0.021	0.035						
N	49	152	153	82	90	152	154	154					
(9) APPROVED Dummy	0.217	-.570**	.438**	0.085	-0.055	.165*	-.416**	.346**	1				
Sig.	0.135	0	0	0.45	0.607	0.042	0	0					
N	49	152	153	82	90	152	154	154	154				
(10) LIQUIDATED Dummy	-0.217	-.237**	0.123	0.003	0.174	0.1	-.188*	0.119	-.167*	1			
Sig.	0.135	0.003	0.13	0.98	0.102	0.219	0.019	0.142	0.038				
N	49	152	153	82	90	152	154	154	154	154			
(11) TRADEVOL	.357*	0.178	-0.013	0.073	-0.051	-0.117	.397**	-0.066	0.123	-0.033	1		
Sig.	0.013	0.109	0.906	0.646	0.658	0.294	0	0.557	0.272	0.766			
N	48	82	82	42	78	82	82	82	82	82	82		
(12) LN SIZE	0.138	.437**	-0.14	-0.091	0.138	-.405**	.455**	-.189*	-.226**	-0.082	.471**	1	
Sig.	0.351	0	0.087	0.42	0.194	0	0	0.02	0.005	0.316	0		
N	48	152	152	81	90	151	152	152	152	152	82	152	
(13) ANNOTIMELEFT%	0.045	.232*	-0.019	-0.008	-0.183	-.234*	.257*	-0.047	0.188	-.280*	.309**	.319**	1
Sig.	0.763	0.037	0.865	0.961	0.112	0.035	0.021	0.68	0.093	0.011	0.005	0.004	
N	48	81	81	42	77	81	81	81	81	81	81	81	81

6. Empirical results and analysis

This section presents the empirical results of the study. First, the descriptive sample characteristics are presented. Secondly, the market reactions to merger agreement and merger completion announcements are discussed. The third and final part provides results from the regression analysis for finding significant determinants of the market reaction to the announcement events.

6.1. Abnormal returns during merger announcement

The sample for the merger agreement announcement event study includes 74 observations during the research period from January 1, 2003 to February 28th, 2008. Table 4 depicts the cumulative abnormal results for various intervals.

In Panel A of Table 4 we find the results for the whole sample of the merger agreement announcement event. Limited sample size reduces the statistical significance of the results, but several issues arise from the data. Pre-announcement average CARs are all statistically significant at 10 % level and positive, although the mean values range only between 0.87 and 1.77 percent. Minimum values of the three pre-announcement CARs are all negative, largest negative being -19.30 % found in the (-20, -1) period. Such abnormal returns are surprising as investors have the option to convert their shares to cash at the time of the shareholder vote. This implies trading which may stem from an individual investor being forced to liquidate her position too swiftly for the generally low liquidity of SPAC shares to allow the price to stay at a fair level. Another explanation is that investors who don't like the proposed deal sell their shares when the share price is at a premium over the conversion value.

Announcement window average CARs carry less statistical significance, although the 2.19 % in the (-5, +5) window is significant at 5 % level. It is interesting to note that, while not statistically significant, most of the abnormal returns in the (-20, +20) window are accumulated in the pre-announcement period. This suggests that even in the merger announcement event some information is leaked and positive abnormal returns start to accumulate prior to the announcement. This result suggests accepting *H3a*. Interestingly

enough, the periods that are typically at the crux (i.e., (-1, +1) and event day 0) of an event study show little or no positive returns and are not statistically significant.

Panel B of Table 4 shows the CARs for the SPACs that eventually completed a merger. In support of *H1,* we find that the returns in Panel B are throughout higher than those for the whole sample in Panel A. Although statistical significance is again an issue, we find results for the pre-announcement windows of (-20, -1) and (-10, -1) to be significant at 5 % level. Also announcement window results for (-10, +10) and (-5, +5) are significant at 10 % level.

Panels C and D in Table 4 show CARs for the sample of SPACs that were eventually liquidated and for the sample of SPACs in process without a known outcome respectively. Sample sizes for these breakdowns hinder the statistical significance of the results with the exception of the (-1, +20) window where a negative return of -2.219 % is statistically significant at 5 % level.

Table 6. Cumulative abnormal returns in the merger announcement event

The table reports mean cumulative abnormal returns on different event windows for 38 SPACs that successfully completed a merger in 1/2003-2/2008. Also, statistical significance (p-value) along with maximum, minimum and median values for each event window are reported.

Panel A						Panel B					
Whole sample (N = 72)						Completed mergers (N = 38)					
Period	Mean	Sig.	Max	Min	Median	Period	Mean	Sig.	Max	Min	Median
Pre-announcement						*Pre-announcement*					
(-20, -1)	1.77 % (1.972)	0.052	30.52 %	-19.30 %	1.19 %	(-20, -1)	2.24 % (2.405)	0.021	20.67 %	-8.49 %	2.31 %
(-10, -1)	0.92 % (1.884)	0.064	12.48 %	-10.27 %	0.29 %	(-10, -1)	1.29 % (2.096)	0.043	12.48 %	-5.86 %	0.36 %
(-5, -1)	0.87 % (1.763)	0.082	22.28 %	-7.32 %	-0.19 %	(-5, -1)	1.04 % (1.506)	0.141	22.28 %	-4.74 %	-0.36 %
Announcement						*Announcement*					
(-20, +20)	2.41 % (1.294)	0.200	86.46 %	-34.03 %	-0.13 %	(-20, +20]	5.02 % (1.683)	0.101	86.46 %	-21.54 %	2.59 %
(-10, +10)	1.79 % (1.569)	0.121	51.6%	-19.20 %	-0.12 %	(-10, +10]	3.031% (1.758)	0.087	51.60 %	-19.20 %	0.95 %
(-5, +5)	2.19 % (2.208)	0.030	45.84 %	-14.37 %	0.71 %	(-5, +5)	3.28 % (1.945)	0.059	45.84 %	-14.37 %	1.28 %
(-1, +1)	0.51 % (1.237)	0.220	23.13 %	-6.81 %	0.03 %	(-1, +1)	0.79 % (1.123)	0.269	23.13 %	-6.81 %	1.05 %
(0)	-0.05 % (-0.384)	0.702	5.49 %	-5.90 %	0.10 %	(0)	0.06 % (0.379)	0.707	5.49 %	-1.63 %	0.24 %
Post-announcement						*Post-announcement*					
(-1, +5)	1.24 % (1.295)	0.199	48.28 %	-19.33 %	0.23 %	(-1, +5)	2.17 % (1.244)	0.221	48.28 %	-19.33 %	0.58 %
(-1, +10)	0.79 % (0.726)	0.470	43.93 %	-31.24 %	-1.12 %	(-1, +10)	1.94 % (1.004)	0.322	43.93 %	-31.24 %	-0.63 %
(-1, +20)	0.55 % (0.357)	0.722	74.21 %	-30.09 %	-1.66 %	(-1, +20)	2.71 % (0.956)	0.345	74.21 %	-30.09 %	0.82 %

Panel C					
Liquidated SPACs (N = 10)					
Period	Mean	Sig.	Max	Min	Median
Pre-announcement					
(-20, -1)	3.21 % (0.999)	0.158	30.52 %	-5.46 %	2.46 %
(-10, -1)	-0.41 % (-0.363)	0.553	5.81 %	-6.72 %	0.70 %
(-5, -1)	-0.02 % (-0.024)	0.583	4.92 %	-3.79 %	0.26 %
Announcement					
(-20, +20)	2.68 % (0.690)	0.416	30.08 %	-8.54 %	-2.51 %
(-10, +10)	1.16 % (0.514)	0.813	15.79 %	-9.68 %	-1.37 %
(-5, +5)	0.13 % (0.118)	0.744	6.52 %	-3.97 %	-1.68 %
(-1, +1)	0.54 % (0.774)	0.976	3.89 %	-2.90 %	-0.95 %
(0)	0.22 % (0.626)	0.875	2.14 %	-1.50 %	-0.15 %
Post-announcement					
(-1, +5)	0.24 % (0.262)	0.485	4.62 %	-8.01 %	-1.72 %
(-1, +10)	1.67 % (1.162)	0.890	10.18 %	-7.14 %	-2.07 %
(-1, +20)	-0.44 % (-0.245)	0.382	10.01 %	-6.15 %	-4.23 %

Panel D					
Merger announced, in process (N = 22)					
Period	Mean	Sig.	Max	Min	Median
Pre-announcement					
(-20, -1)	0.53 % (0.291)	0.886	24.15 %	-19.30 %	-1.31 %
(-10, -1)	0.90 % (0.907)	0.332	9.52 %	-10.27 %	-0.14 %
(-5, -1)	0.96 % (1.008)	0.382	16.67 %	-7.32 %	0.47 %
Announcement					
(-20, +20]	-1.51 % (-0.590)	0.225	24.80 %	-34.03 %	-3.38 %
(-10, +10]	-0.19 % (-0.127)	0.897	14.32 %	-11.49 %	-1.32 %
(-5, +5)	1.40 % (1.065)	0.169	17.33 %	-10.98 %	0.37 %
(-1, +1)	0.10 % (0.190)	0.964	5.93 %	-6.71 %	-0.60 %
(0)	-0.32 % (-1.111)	0.211	1.35 %	-5.90 %	-0.07 %
Post-announcement					
(-1, +5)	28.10 % (0.299)	0.334	11.96 %	-6.71 %	0.22 %
(-1, +10)	-1.24 % (-1.126)	0.255	10.76 %	-9.57 %	-2.30 %
(-1, +20)	-2.22 % (-1.777)	0.024	10.76 %	-15.22 %	-3.02 %

Table 7. Abnormal returns in merger announcement event window

The table reports mean daily abnormal returns (AR) and cumulative mean daily abnormal returns (CAR) for 72 SPACs that announced a merger in 1/2003-2/2008. The table also reports the t-statistics from two-tailed t-tests and statistical significances for each day of the period.

Day	AR	CAR	t-stat	Sig.	Day	AR	CAR	t-stat	Sig.
-20	-0.07 %	-0.07 %	-0.361	0.719	1	0.66 %	2.44 %	2.164	0.034
-19	0.11 %	0.04 %	0.886	0.378	2	0.69 %	3.12 %	1.596	0.115
-18	0.01 %	0.05 %	0.027	0.979	3	0.28 %	3.40 %	0.945	0.348
-17	-0.13 %	-0.08 %	-0.74	0.462	4	0.04 %	3.44 %	0.224	0.824
-16	0.04 %	-0.04 %	0.264	0.793	5	-0.23 %	3.20 %	-1.699	0.094
-15	-0.15 %	-0.20 %	-1.043	0.300	6	0.14 %	3.35 %	0.553	0.582
-14	0.27 %	0.08 %	1.917	0.059	7	-0.18 %	3.16 %	-1.067	0.290
-13	0.30 %	0.38 %	1.108	0.271	8	-0.27 %	2.90 %	-1.661	0.101
-12	0.12 %	0.50 %	0.661	0.511	9	-0.03 %	2.87 %	-0.143	0.886
-11	0.39 %	0.89 %	1.913	0.060	10	-0.16 %	2.71 %	-0.79	0.432
-10	0.13 %	1.02 %	0.889	0.377	11	0.12 %	2.82 %	0.518	0.606
-9	0.06 %	1.08 %	0.602	0.549	12	-0.28 %	2.54 %	-1.535	0.130
-8	0.10 %	1.18 %	0.784	0.435	13	-0.44 %	2.10 %	-1.182	0.242
-7	-0.11 %	1.08 %	-0.802	0.425	14	0.23 %	2.33 %	1.525	0.132
-6	-0.14 %	0.94 %	-0.552	0.583	15	-0.09 %	2.24 %	-0.265	0.792
-5	0.38 %	1.32 %	1.194	0.236	16	-0.04 %	2.20 %	-0.223	0.824
-4	0.12 %	1.44 %	0.544	0.588	17	-0.13 %	2.07 %	-0.58	0.564
-3	0.29 %	1.74 %	2.581	0.012	18	0.18 %	2.26 %	1.073	0.287
-2	0.19 %	1.92 %	1.248	0.216	19	0.09 %	2.35 %	0.484	0.630
-1	-0.09 %	1.83 %	-0.603	0.548	20	0.10 %	2.45 %	0.51	0.612
0	-0.05 %	1.78 %	-0.384	0.702					

Figure 3 presents the abnormal and cumulative abnormal returns for the whole sample in the event window (-20, +20). We see that highest daily abnormal return is rather modest at well below one percent. It appears that the announcement event is not considered to be significant news nor does it stimulate trading activity. This is supported by the data in Table 5, which presents the daily abnormal and cumulative abnormal returns in the merger announcement

window (-20, +20). While most of the days are not statistically significant, we see that the daily ARs are very low even in the vicinity of the event date.

However, we find support for the notion that returns start to accumulate prior to the announcement event. This is evident from the profile of the cumulative abnormal returns, which greatly differs from those typically associated with a significant event: instead of the typical accumulation of the abnormal returns within one or two days around the event date we find the abnormal returns accumulating with a moderate slope starting already 14 days prior to the event date.

Figure 3 presents the cumulative abnormal returns to each subset to examine their differences. Support for the superior performance of completed mergers is found, but given the poor statistical significance of the data, further analysis is futile.

In summary, the cumulative abnormal returns in the merger announcement event are small and start to accumulate well before the event date.

Figure 3. Merger announcement: Abnormal returns in the event window

The figure shows mean daily abnormal returns (AR) and cumulative abnormal returns (CAR) for 72 SPACs that announced a merger agreement with a target company in 1/2003-2/2008 from 20 days before the announcement through 20 days after the announcement. The abnormal return is calculated based on constant mean model parameters estimated in (-70, -21) before the announcement event. The x-axis is the day relative to the merger completion announcement date. The y-axis is the cumulative abnormal return.

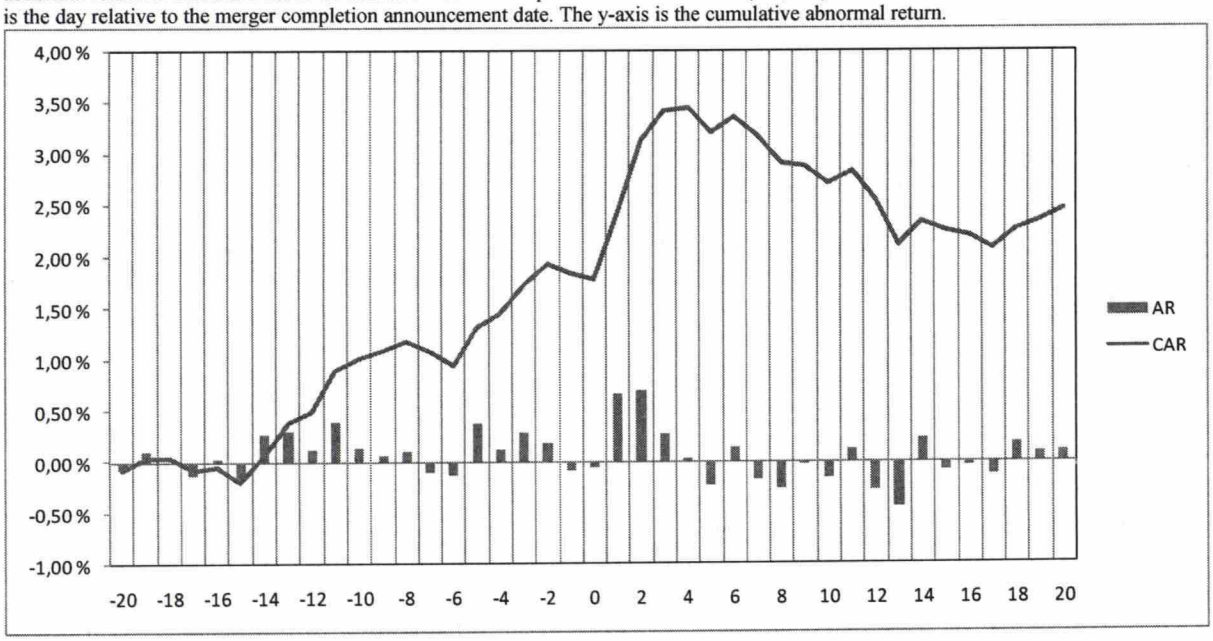
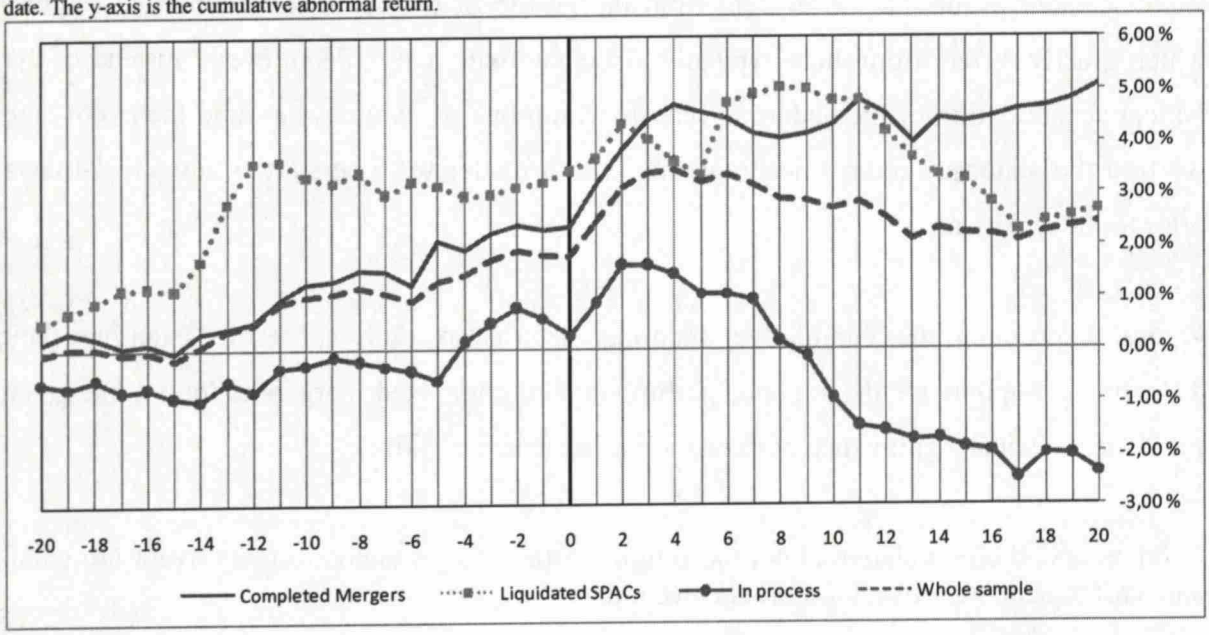


Figure 4. Merger announcement: Subsample abnormal returns in the event window

The figure shows mean daily abnormal returns (AR) and cumulative abnormal returns (CAR) for 72 SPACs that announced a merger agreement with a target company in 1/2003-2/2008 from 20 days before the announcement through 20 days after the announcement. The sample is divided into subsets based on the post-announcement status; 38 SPACs that have successfully completed a merger, 11 SPACs that were liquidated and 23 SPACs that have yet to vote on the merger. The abnormal return is calculated based on constant mean model parameters estimated in (-70, -21) before the announcement event. The x-axis is the day relative to the merger completion announcement date. The y-axis is the cumulative abnormal return.



6.2. Abnormal returns during merger completion

CARs for the merger completion announcement are depicted in Table 6. The small sample size again severely restricts our analysis yielding no statistically significant results. While returns in the (-1, +1) window and at event date are positive, the data suggests that the CARs diminish shortly after the event date.

The behaviour of the abnormal returns is depicted in Figure 4. The three days prior to the event date we experience negative returns for the sample, which creates a dip in the cumulative abnormal returns and hinders making any definitive conclusions regarding the timing and accumulation of abnormal returns in the pre-event window. Again, highest daily mean abnormal returns are very modest at approximately two percent, but unlike in the announcement event, we can identify positive ARs in the immediate vicinity of the event date in (-1, +1) and (0). The daily average ARs for the whole sample are presented in Table 7. However, it should be noted that observing the maximum values implies that investors

screening the merger proposals of their SPACs carefully are able to achieve very high abnormal returns.

Table 8. Cumulative abnormal returns at merger completion announcement

The table reports mean cumulative abnormal returns on different event windows for 38 SPACs that successfully completed a merger in 1/2003-2/2008. Also statistical significance (p-value) along with maximum, minimum and median values for each event window are reported.

Period	Mean	t-stat	Sig.	Max	Min	Median
Pre-announcement						
(-20, -1)	-1.97 % *(-0.706)*	-0.706	0.484	19.14 %	-16.31 %	1.90 %
(-10, -1)	-1.23 % *(-0.499)*	-0.499	0.620	18.32 %	-14.78 %	1.44 %
(-5, -1)	-2.03 % *(-0.751)*	-0.751	0.457	12.27 %	-11.10 %	0.04 %
Announcement						
(-20, +20)	-4.13 % *(-1.087)*	-1.087	0.283	64.37 %	-79.71 %	-4.03 %
(-10, +10)	-0.003 *(-0.084)*	-0.084	0.933	85.45 %	-203.95 %	-3.96 %
(-5, +5)	0.004 *(0.171)*	0.171	0.865	66.26 %	-37.99 %	-0.94 %
(-1, +1)	2.74 % *(0.77)*	0.77	0.446	162.96 %	-27.83 %	-1.10 %
(0)	2.04 % *(0.808)*	0.808	0.424	64.57 %	-23.04 %	0.29 %
Post-announcement						
(-1, +5)	1.37 % *(0.349)*	0.349	0.729	174.06 %	-32.76 %	-2.46 %
(-1, +10)	-0.10 % *(-0.024)*	-0.024	0.981	176.62 %	-212.56 %	-4.85 %
(-1, +20)	-3.23 % *(-0.713)*	-0.713	0.480	163.22 %	-69.51 %	-5.92 %

Table 9. Merger completion: Abnormal returns in the event window

The table reports mean daily abnormal returns (AR) and cumulative mean daily abnormal returns (CAR) for 38 SPACs that completed a merger in 1/2003-2/2008. The table also reports the t-statistics from two-tailed t-tests and statistical significances for each day of the period.

Day	AR	CAR	t-stat	Sig.	Day	AR	CAR	t-stat	Sig.
-20	-0.09 %	-0.09 %	-0.28	0.781	1	1.77 %	1.83 %	1.081	0.286
-19	0.35 %	0.26 %	1.068	0.292	2	-0.32 %	1.51 %	-1.02	0.314
-18	-0.47 %	-0.21 %	-1.505	0.140	3	0.00 %	1.51 %	-0.003	0.998
-17	-0.18 %	-0.39 %	-0.444	0.659	4	-0.51 %	1.00 %	-1.498	0.142
-16	0.31 %	-0.08 %	0.624	0.536	5	-0.55 %	0.46 %	-1.472	0.149
-15	0.04 %	-0.04 %	0.128	0.899	6	0.09 %	0.54 %	0.192	0.849
-14	-0.04 %	-0.09 %	-0.176	0.861	7	-0.15 %	0.40 %	-0.566	0.574
-13	0.05 %	-0.03 %	0.197	0.845	8	-0.94 %	-0.54 %	-2.119	0.040
-12	-0.59 %	-0.62 %	-1.53	0.134	9	-0.09 %	-0.64 %	-0.326	0.746
-11	-0.13 %	-0.76 %	-0.608	0.547	10	-0.41 %	-1.05 %	-0.84	0.406
-10	0.08 %	-0.67 %	0.321	0.750	11	0.69 %	-0.36 %	0.984	0.331
-9	0.21 %	-0.46 %	0.826	0.413	12	-0.28 %	-0.64 %	-0.752	0.456
-8	0.35 %	-0.11 %	0.834	0.409	13	-0.45 %	-1.09 %	-1.059	0.296
-7	-0.07 %	-0.17 %	-0.23	0.819	14	-0.34 %	-1.43 %	-0.936	0.355
-6	0.22 %	0.05 %	0.576	0.568	15	-0.30 %	-1.72 %	-0.742	0.462
-5	0.64 %	0.69 %	1.479	0.147	16	-1.17 %	-2.89 %	-3.323	0.002
-4	-0.08 %	0.61 %	-0.344	0.732	17	0.11 %	-2.78 %	0.253	0.801
-3	-0.85 %	-0.24 %	-0.605	0.548	18	-0.36 %	-3.14 %	-1.142	0.261
-2	-0.67 %	-0.91 %	-0.945	0.350	19	-0.49 %	-3.63 %	-1.733	0.091
-1	-1.07 %	-1.99 %	-1.508	0.139	20	-0.70 %	-4.33 %	-1.538	0.132
0	2.04 %	0.06 %	0.808	0.424					

To further examine the returns and their development beyond the (-20, +20) event window I present the abnormal returns for (-1, +70) in Figure 5. The message is quite discouraging as the negative returns continue throughout the whole period steadily decreasing the cumulative abnormal returns. This is intuitively consistent with the level of dilution shareholders in a completed merger experience. However, the reasons are addressed in greater detail in the next section in the regression analysis.

Figure 5. Merger completion: Abnormal returns in the event window (-20, +20)

The figure shows mean daily abnormal returns (AR) and cumulative abnormal returns (CAR) for 38 SPACs that successfully completed a merger with a target company in 1/2003-2/2008 from 20 days before the announcement through 20 days after the announcement. The abnormal return is calculated based on the market model parameters estimated in (-70, -21) before the event date using Russell 2000 as the market proxy. The x-axis is the day relative to the merger completion announcement date. The y-axis is the cumulative abnormal return.

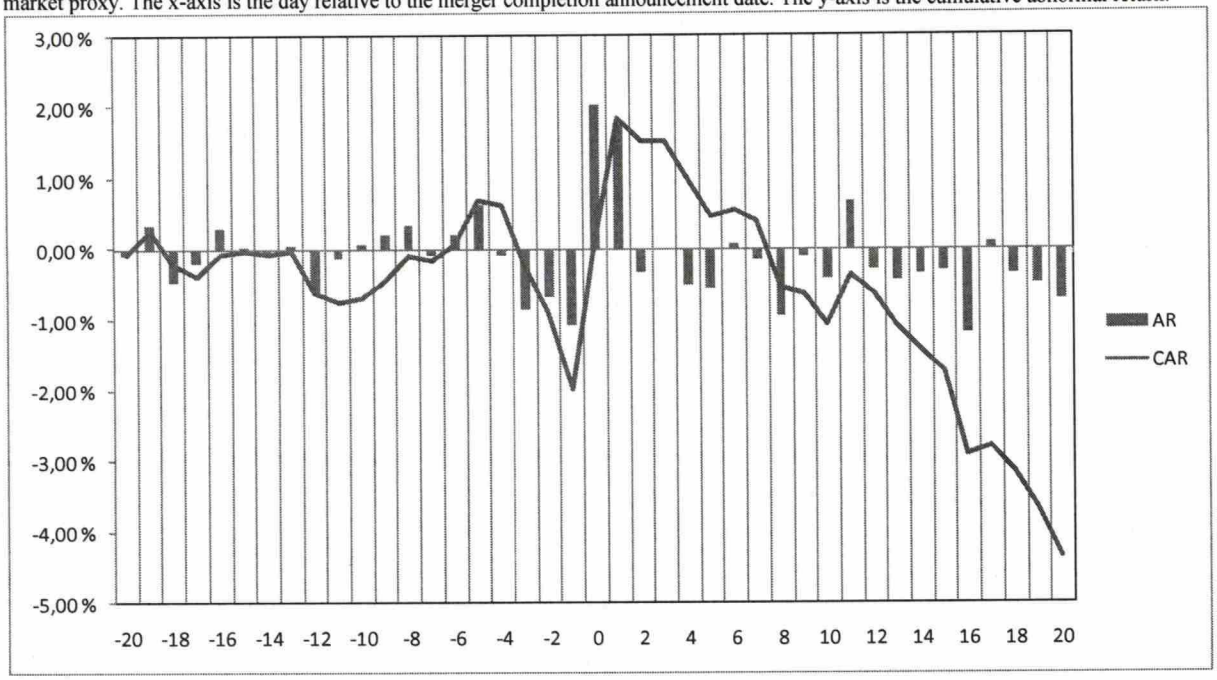
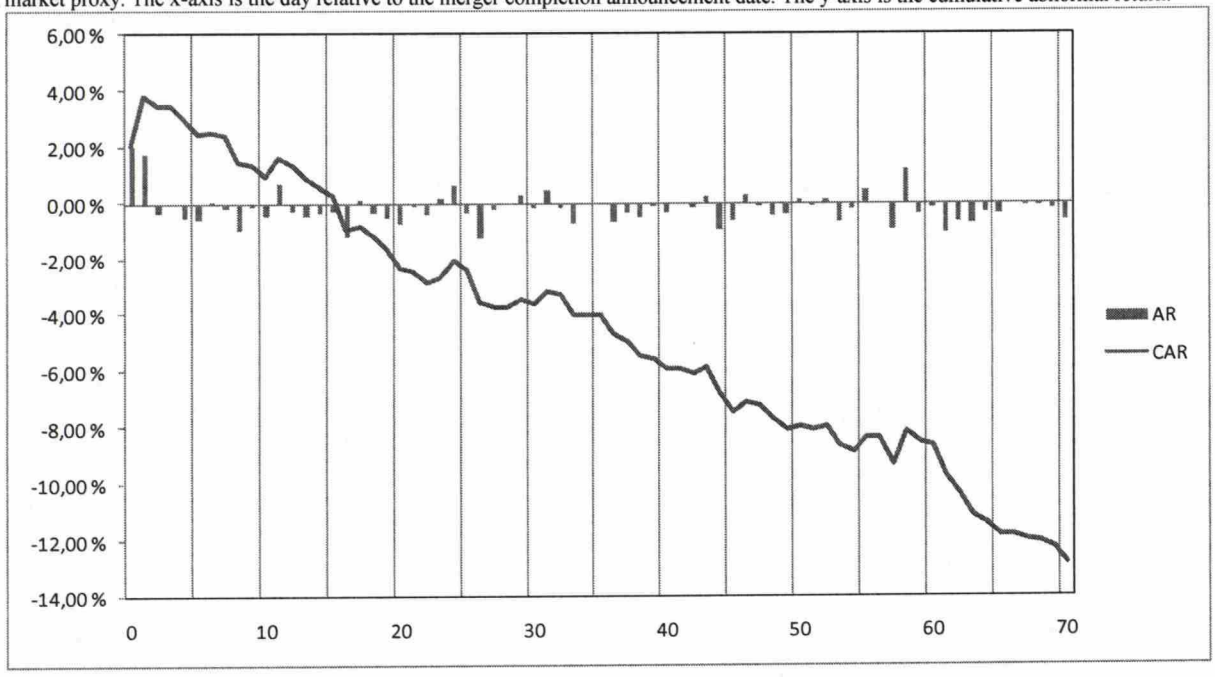


Figure 6. Merger completion: Abnormal returns in the post-event window (0, +70)

The figure shows mean daily abnormal returns (AR) and cumulative abnormal returns (CAR) for 38 SPACs that successfully completed a merger with a target company in 1/2003-2/2008 from 1 day before the announcement through 70 days after the announcement. The abnormal return is calculated based on the market model parameters estimated in (-70, -21) before the event date using Russell 2000 as the market proxy. The x-axis is the day relative to the merger completion announcement date. The y-axis is the cumulative abnormal return.



6.3. Multivariate regression analysis

In this section I report the results from the ordinary least squares (OLS) regression analysis. All regression setups are run for (-5, +5) and (-1, +20) windows. Regressions were also run for (-1, +1), but based on CAR analyses in section 7.2 and 7.3 individual observations dominate the results in the three-day period and the results do not accurately represent the sample, nor yield statistically significant results. The extended (-1, +20) window was chosen to present a more complete view of the share price development as event study analysis in previous section showed negative CARs in the period after merger completion.

6.3.1. Merger agreement announcement

I use regression analysis to examine the abnormal returns in the merger agreement announcement event for the whole sample of merger announcements and then run the analysis on the sample restricted to SPACs that eventually completed a merger.

The results from the regression analysis for the (-5, +5) and (-1, +20) windows are depicted in Panel A of Table 8. Models (1) and (4) include all variables used in the regression analysis. Models (2) and (5) are used to highlight the coefficients of SPAC or deal characteristics that are clearly discussed in earlier literature. Models (3) and (6), in turn, are used emphasize the investor perspective and include the characteristics of a SPAC known at the time of the IPO.

Panel A yields little results due to lack of statistical significance. However, some implications arise from the data. The level of trading volume does seem to be negatively correlated with the returns, thus supporting the liquidity discount hypothesis arising from earlier literature. The coefficient for the size of the deferred underwriter's fee is also negative in all models it is included in. This suggests that investors at the very least perceive it as a contingent liability which at the time of the merger announcement has an increased probability of coming to effect. Leverage sees coefficients very close to zero. This could be due to the fact that at the time of the announcement very little deal specific information is released or even known by the management. Size of the SPAC seems also to play no role in determining the abnormal returns in either observation window.

Table 10. Regression analysis results for merger announcement

The table presents ordinary least squares regression models for the determination of cumulative abnormal returns in selected event windows. Models (1) and (2) include all variables. Models (2) and (5) include variables directly relevant to earlier literature. Models (3) and (6) include variables related to SPAC characteristics known at the time of the IPO. The table reports the regression coefficients and t-statistics (in parentheses) for the independent variables in the model along with the F-value, statistical significance (p-value), R^2 and adjusted R^2. For each coefficient, ***, **, and * indicate that the coefficient is different from zero at 1 %, 5 % and 10 % levels respectively. Dependent variables in the models are the cumulative abnormal returns during either a period of (-5, +5) or (-1, +20) around the merger announcement date, which is day 0. Independent variables are defined as follows: TIME is the relative amount of time left in the acquisition window at the time of merger agreement announcement. SIZE is the amount of IPO gross proceeds. LEVERAGE is the relative size of the acquired assets to SIZE. INTRUST is the percentage of IPO gross proceeds placed in a trust fund. DILUTION is the dilution coming to effect at merger completion due to management owned shares. RISKFREE is the 3-month T-bills rate. INDUSTRY is a dummy variable with the value 1 if SPAC focuses on certain industry or industries and is 0 otherwise. UWFEE is the total underwriter's fee (%) in the SPAC IPO. UWFEEDEF is the underwriter's fee (%) that is paid only upon the completion of a merger. PAYMETHOD is a dummy variable with the value 1 if stock is used as a payment method in the merger and is 0 otherwise. APPROVED is a dummy variable with the value 1 if the SPAC has completed a merger and is 0 otherwise. LIQUIDATED is a dummy variable with the value 1 if the SPAC was liquidated and otherwise 0.

		Panel A: Whole sample (N = 72)					
		CARs (-5, +5)			CARs (-1,+20)		
Independent variable	Expected sign	(1)	(2)	(3)	(4)	(5)	(6)
(Constant)		-0.598	-0.015	-0.367	0.485	-0.044	0.595
		(-0.645)	*(-0.158)*	*(-1.019)*	*(0.333)*	*(-0.311)*	*(1.060)*
LEVERAGE	+	0.005	0.008		0.015	0.021	
		(0.226)	*(0.476)*		*(0.409)*	*(0.83)*	
INTRUST	+	0.480		0.361	-0.512		-0.449
		(0.560)		*(1.117)*	*(-0.379)*		*(-0.890)*
DILUTION	-	0.105		0.137	0.131		0.258
		(0.233)		*(0.741)*	*(0.186)*		*(0.898)*
RISKFREE	-	0.957	0.764		0.667		
		(0.351)	*(0.395)*		*(0.155)*		
FOCUS	+	-0.028		-0.030	-0.014		-0.018
		(-0.478)		*(-1.356)*	*(-0.15)*		*(-0.539)*
UWFEE	+	0.732		0.613	-0.177		-0.154
		(0.335)		*(0.690)*	*(-0.051)*		*(-0.111)*
UWFEEDEF	-	-1.549		-1.514	-0.373		-0.619
		(-0.696)		*(-1.733)*	*(-0.106)*		*(-0.454)*
PAYMETHOD	+	0.033	0.021		0.031	0.060	
		(0.413)	*(0.380)*		*(0.244)*	*(0.333)*	
TRADEVOL	-	-0.261	-0.253		-0.571	-0.652	
		(-0.444)	*(-0.704)*		*(-0.617)*	*(0.718)*	
LN SIZE	-	0.005		0.002	-0.005		-0.017
		(0.121)		*(0.093)*	*(-0.081)*		*(-0.677)*
TIME%	+	0.071			0.092		
		(0.453)			*(0.373)*		
APPROVED		0.007			-0.009		
		(0.105)			*(-0.084)*		
LIQUIDATED		0.003			-0.004		
		(0.032)			*(-0.029)*		
F-stat		0.173	0.211	1.172	0.159	0.524	1.225
Sig.		0.998	0.929	0.332	0.999	0.719	0.305
R^2		0.158	0.039	0.099	0.091	0.091	0.103
Adjusted R^2		-0.754	-0.144	0.015	-0.082	-0.082	0.019

		Panel B: Completed mergers (N = 38)					
		CARs (-5, +5)			CARs (-1, +20)		
Independent variable	Expected sign	(7)	(8)	(9)	(10)	(11)	(12)
(Constant)		-0.249	-0.034	-0.025	1.074	-0.067	1.231
		(-0.212)	*(-0.267)*	*(-0.042)*	*(0.551)*	*(-0.324)*	*-1.210*
LEVERAGE	+	0.004	0.002		0.008	0.020	
		(0.135)	*(0.101)*		*(0.153)*	*(0.549)*	
INTRUST	+	0.156		0.107	-0.824		-0.864
		(0.119)		*-0.180*	*(-0.379)*		*(-0.851)*
DILUTION	-	-0.226		-0.231	0.610		0.408
		(-0.287)		*(-0.709)*	*(0.468)*		*(0.736)*
RISKFREE	-	2.285	1.397		2.731	1.800	
		(0.583)	*(0.557)*		*(0.421)*	*(0.437)*	
FOCUS	+	-0.075		-0.058	-0.053		-0.075
		(-0.769)		*(-1.474)*	*(-0.328)*		*(-1.111)*
UWFEE	+	-0.491		-0.566	0.749		-0.937
		(-0.169)		*(-0.438)*	*(0.155)*		*(-0.427)*
UWFEEDEF	-	-0.547		-1.341	1.988		1.046
		(-0.161)		*(-0.893)*	*(0.353)*		*-0.410*
PAYMETHOD	+	0.051	0.017		-0.015	0.055	
		(0.517)	*(0.248)*		*(-0.093)*	*(0.481)*	
TRADEVOL	-	-0.407	-0.201		-0.560	-0.713	
		(-0.495)	*(-0.503)*		*(-0.411)*	*(-1.085)*	
LN SIZE	-	0.009		0.008	-0.068		-0.037
		(0.108)		*(0.274)*	*(-0.480)*		*(-0.782)*
TIME%	+	0.104			0.402		
		(0.425)			*(0.578)*		
F-stat		0.246	0.143	0.941	0.290	0.377	0.901
Sig.		0.982	0.963	0.479	0.969	0.822	0.506
R^2		0.253	0.037	0.146	0.285	0.091	0.141
Adjusted R^2		-0.775	-0.220	-0.009	-0.698	-0.151	-0.016

Panel B presents the regression results for the sample of SPAC that eventually completed a merger. The results are similar to those for the whole sample as statistical significance is again very low and no statistically significant results are found. Consistent with the whole sample data, negative trading volume supports the liquidity discount hypothesis. Level of interest rates appears emphasized over the whole sample with clearly positive coefficients. This contradicts earlier literature as high cost of debt should encourage companies to go public through an IPO themselves. Higher cost of debt also hinders SPACs to use debt to finance the acquisition and gain benefits suggested by agency or free cash flow theory.

Adjusted R^2 values for all models are very low, which is consistent with the low observed levels of the abnormal returns; noise trading and deal specific factors may well account for the majority of the returns. This would partly explain the lack of statistically significant results.

6.3.2. Merger completion announcement

The results from the regression analysis for the (-5, +5) and (-1, +20) windows in the merger completion are depicted in Table 9. Models (13) and (17) include all variables used in the regression analysis. Models (14) and (18) are formulated by staring with the models (13) and (17) and removing a single variable at a time in order of least statistical significance. The resulting models are then evaluated and the one with the highest adjusted R^2 is chosen. Models (15) and (19) are used to highlight the coefficients of SPAC or deal characteristics that are addressed in earlier literature. Models (16) and (20) are again used emphasize the investor perspective and include the characteristics of a SPAC known at the time of the IPO.

In Table 9 we find statistically significant results concerning mainly three variables: the percentage of funds placed in the trust fund (*INTRUST*), the expected dilution from original shareholders' shares (*DILUTION*) and the deferred underwriter's fee (*UWFEEDEF*). We see that all the three variables are included in models (16) and (20), i.e. they are characteristics investors can evaluate prior to subscribing shares in the IPO.

INTRUST is positive with coefficients ranging from 2.759 to 3.862. This result strongly suggests that INTRUST works as a proxy to SPAC quality. Although it should be noted that current market convention has INTRUST converging to 100 %. The coefficients for INTRUST in the extended (-1, +20) window are also positive with values over 3.00 and are statistically significant at 5 % and 1 % for models (18) and (20) respectively. This supports the quality proxy suggestion as the direct relevance of the INTRUST to investors disappears when the merger is completed at $t = 0$ as the investor no longer has the option to convert her shares to a cash.

UWFEEDEF has very large negative coefficients, which are statistically significant at 1 % level in models (14), (16), (18) and (20) and at 10 % level in models (13) and (17). In addition, the coefficients in the models for the (-1, +20) period are almost double to those in (-5, +5). This result is very interesting and has two explanations. First explanation is that investors perceive the deferred fee as a contingent liability, which causes a discount in the value of the SPAC. However, this theory fails to explain why the effect is even stronger when the window is extended beyond the event date. A possible explanation is given by Rau (2000), who suggests that contingent fees in M&As may cause an agency problem between

shareholders and deal advisors. This effect is emphasized by the fact that Rau finds banks accepting contingent fees to be more prestigious and wielding more market power. This enables top-tier banks to accept contingent fees as they are confident in their resources and ability to bring a merger to a conclusion. In SPACs this may result in poorer acquisition targets being presented to investors as more lucrative with the collaboration of the underwriter and the management team. With the recent evidence from Bodnaruk et al. (2007) regarding investment banks behaviour in M&As we certainly cannot rule this explanation out.

The coefficient for DILUTION is negative, but significantly smaller than UWFEEDEF. This is rather compelling as the measured effect of the expected dilution on the SPACs value at t = 0 is a depreciation of approximately 20 %. For a possible explanation we return to the literature on closed-end funds and especially the event of converting to open-ending structure. As discussed in section 2.4.3, on open-ending, closed-end fund discounts disappear by share rising to converge with NAV of the vehicle. A similar phenomenon may explain why, instead of a dominating 20 % decrease that implies huge negative coefficients for DILUTION we see modest figures between -1.876 and -2.032. The rationale of this proposed explanation is that, unlike closed-end funds that trade at a discount, SPACs could be valued at a "hidden premium" or goodwill due to positive expectations. This premium is countered by the larger negative effect from the expected dilution. However, the dilution effect is restricted in pre-merger trading to the NAV (represented by the trust fund assets) less any liquidity discounts. At merger completion the restriction is lifted and, the dilution takes full effect, but now also the premium which earlier was "buried" under the expected dilution effects the SPAC value and the fixed minimum value guaranteed by the assets in the trust fund. Two effects combine for a negative net effect much smaller than that represented by the expected dilution alone.

Further results from the merger completion event show that size of the SPAC plays little role in determining the abnormal returns, although we find a negative coefficient statistically significant at 5 % level in model (14). The risk-free interest rate carries a large positive coefficient, although not statistically significant. This contradicts the hypotheses of low interest rates being beneficial for SPACs. Part of the explanation may arise from the competition from private equity leveraged buyout (LBO) funds that are shown to be sensitive to interest rate fluctuations. Higher interest rates drive LBO funds from the market, thus

opening up the competition for more advantageous operating environment for SPACs. Tim until liquidation seems to be a negligible factor in all models, as is the case with used leverage, using stock as payment and industry focus. Although none of these results are statistically significant they suggest rejecting hypotheses *H3, H4, H6* and *H7*.

Table 11. Regression analysis results for merger completion

Regression models for the determination of CARs in selected event windows are presented. Models (13) and (17) include all variables. Models (14) and (18) are formulated by removing one variable at a time from the all variables models in the order of highest p-value. From the results the model with the highest adjusted R^2 is then selected. Models (15) and (19) include variables directly relevant to earlier literature. Models (16) and (20) include variables related to SPAC characteristics known at the time of the IPO. Table includes regression coefficients and t-stats for the independent variables in the model. T-stats are in parentheses. Possible statistical significance (p-value) is denoted with asterisks after the coefficient value. TIME is the relative amount of time left in the acquisition window at the time of merger agreement announcement. SIZE is the amount of IPO gross proceeds. LEVERAGE is the relative size of the acquired assets to SIZE. INTRUST is the percentage of IPO gross proceeds placed in a trust fund. DILUTION is the dilution coming to effect at merger completion due to management owned shares. RISKFREE is the 3-month T-bills rate. INDUSTRY is a dummy variable with the value 1 if SPAC focuses on certain industry or industries and is 0 otherwise. UWFEE is the total underwriter's fee (%) in the SPAC IPO. UWFEEDEF is the underwriter's fee (%) that is paid only upon the completion of a merger. PAYMETHOD is a dummy variable with the value 1 if stock is used as a payment method in the merger and is 0 otherwise.

Dependent variable:		CARs (-5, +5)				CARs (-1, +20)			
Independent variable	Expected sign	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
(Constant)		-2.261 *(-1.831)*	-2.171 *(-1.831)*	-0.081 *(-0.42)*	-2,051*** *(-3.097)*	-3.213 *(-1.226)*	-2.330* *(-1.806)*	-0.147 *(-0.413)*	-3.237** *(-2.448)*
LEVERAGE	+	-0.008 *(-0.246)*		-0.023 *(-0.675)*		-0.016 *(-0.221)*		-0.044 *(-0.694)*	
INTRUST	+	3.649** *(2.65)*	3.775*** *(4.224)*		2.759*** *(4.177)*	4.803 *(1.644)*	3.092** *(2.226)*		3.862*** *(2.927)*
DILUTION	-	-0.314 *(-0.381)*			-0.852** *(-2.366)*	-1.141 *(-0.651)*	-2.032** *(-2.206)*		-1.876** *(-2.607)*
RISKFREE	-	5.087 *(1.236)*	4.211 *(1.672)*	2.644 *(0.687)*		6.448 *(0.738)*		4.445 *(0.626)*	
FOCUS	+	-0.017 *(-0.167)*			0.029 *(0,670)*	-0.041 *(-0.191)*			0.031 *(0.352)*
UWFEE	+	1.567 *(0.513)*	2.142 *(1.164)*		2.520* *(1.764)*	0.844 *(0.13)*			2.688 *(0.942)*
UWFEEDEF	-	-8.185* *(-2.293)*	-8.383*** *(-3.334)*		-7.498*** *(-4.520)*	-15.292* *(-2.019)*	-14.087*** *(-3.241)*		-14.986*** *(-4.523)*
PAYMETHOD	+	0.061 *(0.597)*		-0.044 *(-0.413)*		0.002 *(0.008)*		-0.179 *(-0.912)*	
TRADEVOL	-	0.765 *(0.886)*	0.848 *(1.443)*	-0.259 *(-0.423)*		1.067 *(0.582)*		-0.454 *(-0.401)*	
LN SIZE	-	-0.116 *(-1.288)*	-0.143** *(-2.552)*		-0.039 *(-1.288)*	-0.101 *(-0.528)*			-0.003 *(-0.520)*
TIME	+	-0.071 *(-0.276)*				-0.230 *(-0.421)*			
F-stat Sig.		1.463 0.301	3.779 0.021	0.345 0.844	7.584 < 0.001	0.993 0.518	5.619 0.008	0.508 0.731	6.110 < 0,001
R^2 Adjusted R^2		0.817 0.211	0.636 0.467	0.084 -0.160	0.580 0.503	0.577 -0.004	0.513 0.422	0.119 -0.116	0.526 0.440

6.4. Trading volume analysis

The liquidity of SPACs is very limited. As seen earlier in Table 2, the average trading volumes of SPACs are very low. Table 10 presents the trading volumes relative to the SPAC's market capitalization around the merger completion event.

First, we see that for all periods presented, starting from Day -70, the mean volumes are all clearly higher than the benchmark volume set in the (-70, -20) window before the merger announcement. All results in Table B are statistically significant at 1 % level.

Table 12. Trading volumes at merger completion

The table reports the mean, minimum and maximum trading volumes during the merger completion event in different event windows relative to the benchmark mean level of 100% measured in (-70, -21) before the merger announcement event. Also t-statistic and statistical significance (p-value) is reported.

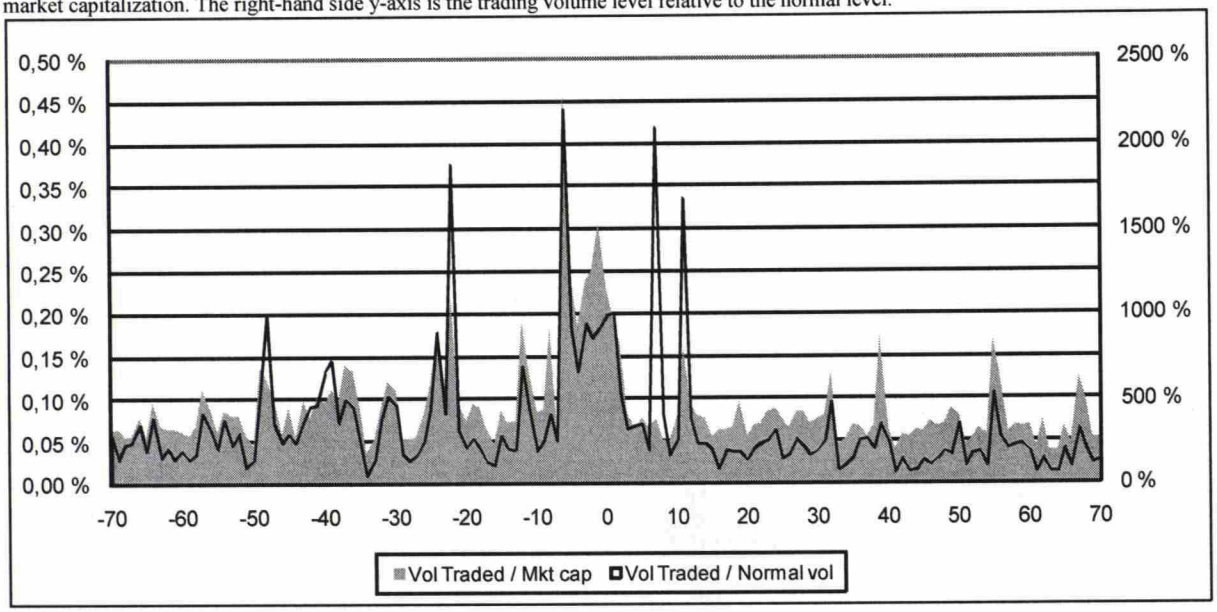
Window	Mean	Sig.	Min	Max
(-70, -20)	355.65 %	0.002	-97.32 %	4001.70 %
	(3.399)			
(-20, -1)	513.11 %	< 0.001	-96.49 %	2582.53 %
	(4.641)			
('-1,+1)	962.94 %	0.001	-100.00 %	6070.38 %
	(3.743)			
(-5, +5)	706.60 %	< 0.001	-98.94 %	3882.26 %
	(4.568)			
(-1, +20)	498.85 %	0.005	-98.77 %	5144.47 %
	(2.967)			
(-1, +70)	301.82 %	0.006	-93.46 %	2858.69 %
	(2.895)			

The trading volumes peak at 962.94 % in (-1, +1), but level down to 301.82 % in (-1, +70). This evidence supports the notion that the completion of a merger does not result in a immediate increase of trading activity. Therefore we are inclined to accept *H9*.

The average trading volumes in (-20, +20) window at the merger completion announcement event are depicted in Figure 7, which allows for visual confirmation that the trading volumes do not experience a persisting increase after the event date.

Figure 7. Trading volumes

Figure reports the mean relative trading volumes. The line represents the trading volume relative to the normal trading volume of 100 % measured in (-70, -21) before the merger announcement event. The area represents the trading volume relative to the market capitalization of the SPAC. The x-axis is the day relative to the merger completion date. The left-hand side y-axis is the trading volume relative to the SPAC market capitalization. The right-hand side y-axis is the trading volume level relative to the normal level.



7. Summary and conclusions

The goal of this thesis was to examine a new investment class – the Special Purpose Acquisition Company – from the investor's perspective and be first to document issues relevant to those investing in SPACs. This goal was summarized in and studied through two research problems:

I. *Do abnormal returns for SPAC shareholders exist*
   a. *During a merger announcement?*
   b. *During a merger completion?*

II. *Which SPAC characteristics drive the share price performance and how relevant are they in explaining returns to SPAC shareholders*

Consequently, the thesis starts by giving an overview of SPACs including a brief history review, summary of relevant legislation and a description of the mechanics of a SPAC from the IPO until the eventual merger or liquidation. Next, a review of relevant literature is presented. As no earlier studies on SPACs or blank check companies have been published, this section aims to establish an understanding of what areas relevant to SPACs have been studied and what the results have been. An emphasis is put on the implications on the feasibility of SPAC as an investment vehicle. Based on a combination of theory and SPAC's novel features, a set of eleven hypotheses were formulated to meet the objective of this study. In the empirical part of the thesis the hypotheses were tested and the results reported. Finally this section concludes the study.

First I briefly present the data used in this thesis and then move to discuss the results and contribution of the study. The empirical results are summarized in Table 12 in sub-section 7.3. Finally, sub-section 7.4 reviews ideas and suggestions for further research.

This thesis employs a data sample of 152 SPACs issued between 2003 and February, 2008. However, the number of sample companies studied in the events was only 72 and 38 for the merger agreement announcement and the merger completion announcement respectively. This is due to the fact that only 72 companies in the sample had announced a merger agreement. Of those 72 only 38 had completed a merger while 10 were liquidated. The data

sample is obviously small, which is reflected in a lack of statistical significance in the results. For certain parts of the regression analysis less data was available for the sample, hence slightly varying sample sizes. The share price data, market index data and the interest rate data was collected from Thomson Datastream database. All other information was manually gathered from the company filings in the SEC Edgar database.

7.1. Evidence on abnormal returns during merger announcement

The first hypothesis studied through the event study methodology is *H1* which proposed that the abnormal returns in the merger announcement window are higher for the SPACs that eventually completed a merger than for the whole sample. The results clearly support this hypothesis although the differences are small. In window (-20, +20) the mean CARs of the whole sample and completed mergers are 2.41 % and 5.02 % respectively. However, the value for the completed mergers subsample barely escapes statistical significance. Statistically significant results arise in the (-5, +5) window where the mean CAR for the whole sample is 2.19 % and statistically significant at 5 % level while completed mergers subsample yields CAR of 3.28 % with a statistical significance of 10 %. Based on the evidence we can accept *H1*.

The second hypothesis studied through the event study methodology is *H8a*, which proposes that the abnormal returns start to accumulate before the announcement date. The data support also this hypothesis, but the lack of statistically significant results denies drawing final conclusions and accepting *H8a*. However, the data suggest that the abnormal returns start to accumulate approximately two weeks prior to the event and do not follow the typical format expected from market reactions to news.

Moving to the results from the regression analysis, the first hypothesis for the merger announcement studied through regression models proposed is *H3a*, which states that the abnormal returns are positively correlated with the cost of debt. However, results are contradicting if anything. The results show that the relation is positive, but lack of statistical significance again restricts further conclusions. However, the evidence suggests rejecting *H3a.* The possible positive relation may be an indirect result of decreased competition from LBO funds at times of higher cost of debt, which could be stronger than the effect of high

cost of debt driving higher quality companies to go through an IPO themselves as suggested by Bayar and Chemmanur (2006) in their unpublished working paper.

In *H5a* I hypothesized that the abnormal returns are negatively correlated with the average trading volume of SPACs due to the illiquidity discount phenomenon documented in several studies (Amihud and Mendelson, 1989; Amihud, 2002; Lerner and Schoar, 2004). Results support this notion, but are not statistically significant.

Next, in *H6a* I, inspired by the findings of Gompers and Lerner (2006) in the venture capital environment, hypothesized that the abnormal returns are negatively correlated with SPAC size. However, the results do not support this notion; the coefficients are close to zero and not statistically significant. Thus, we have grounds to believe that SPAC size is irrelevant to the returns in the merger announcement event.

Moving to *H7a* we found the coefficient for the time left in the acquisition window at the time of the merger announcement to be small and positive, but not statistically significant. This could be due to the existence of a small agency problem effect between management and shareholders.

7.1.1. Evidence on abnormal returns during merger completion

The only hypothesis analyzed with event study methodology yielded poor results. In *H8* I proposed that the abnormal returns start to accumulate before the event date. In the case of merger completion event we cannot accept the hypothesis as the data shows anomalous behaviour just before the event date.

In the regression analysis we found some interesting results. The most interesting results obviously emerged outside my set of hypothesis. The unexpectedly small negative coefficient for the expected dilution from the original shareholder's shares raised questions regarding the valuation and share price behaviour of SPACs. However, the explanations for this phenomenon are beyond the scope of this study and are left for future research. Returning to the hypotheses, the following results were found in the regression analysis:

First, I hypothesized in *H3b* that the abnormal returns are negatively correlated with the cost of debt. Although the results are not statistically significant we observed moderately high coefficients for the variable, which suggests that the sign of the coefficient is at least positive. We can therefore reject *H3b* as already implied by the results from the merger announcement.

Next, I hypothesized in *H4* that using stocks as payment in the merger leads to higher abnormal returns in as reported by Chang (1998) in his study of acquisitions of private targets. However, the evidence is inconclusive and does not allow accepting *H4.*

In *H5b* I hypothesized that, consistent with the liquidity discount hypothesis, the normal trading volume of SPACs is negatively correlated with the abnormal returns. The evidence from the merger completion is inconsistent with changing coefficient signs. Based on the results we have no grounds to accept *H5b.*

Then, in *H6b* the hypothesis presented was that the SPAC size is negatively correlated with the abnormal returns. Statistical significance was found only in one regression model, but the coefficient was consistently negative leading us to believe in the existence of a weak negative correlation between the abnormal returns and SPAC size.

Time left in the acquisition window at the time of merger announcement was addressed in *H7b*, where I hypothesized that it is negatively correlated with the abnormal returns. However, the results are marginal and do not support accepting the hypothesis.

Next, in *H10* I hypothesized that an agency problem may arise from the deferred underwriter's fee and that the size of the deferred fee is negatively correlated with the abnormal returns. The evidence is strong. The coefficient was found to be large and negative throughout the regression models and statistically significant at 1 % level in most regression models. This is the most important result of the study. The implications of the result should be viewed from the context presented by Rau (2000), who proposes that banks may behave opportunistically in the presence of contingent fees. This implies that underwriters could be able to affect the merger completion process and get targets of lesser quality approved by the shareholders. The fact that the coefficient for the deferred fee is much lower in the extended (-1, +20) event window supports the presented idea. Investors could over time realize that the

value of the target company is actually worse than initially perceived. The contingent liability effect of the deferred fee should remain constant over time.

Finally, in *H11b* I hypothesized that the percentage of IPO proceeds placed in trust fund acts as a proxy to SPAC quality and is positively correlated with the abnormal results. The results support this view with strong statistical significance and positive coefficients. Especially the results in the extended (-1, +20) event window support this view as the actual effect of the trust fund has disappeared, yet the results show coefficients slightly higher than in the (-5, +5) window.

7.2. Main findings and contribution

The main findings are also the from the study are the negative returns in the post-merger period, which reach -4.33 % and -12.84 % for holding periods of 20 and 70 days respectively. However, this assumes that investor does not convert her shares when facing a poor merger proposal. Sophisticated and active investors should be able to greatly improve on the mean returns found in this study.

The regression analysis revealed the likely existence of an agency problem between SPAC shareholders and the IPO underwriters which overshadows the superficial problem of dilution from management's shares at the time of the merger completion. However, the understated effect of the dilution raised a question regarding the valuation of SPACs. Applying the framework from research on closed-end funds allows hypothesizing on the dynamic of how the markets value SPACs, but further research is necessary to understand this aspect of SPACs.

The key contribution of this thesis is to provide first empirical evidence on SPAC as an asset class and most importantly lay ground for future research. This thesis clearly shows that the future research should be focused on the merger completion event instead of the merger announcement, which does not appear to be considered as significant news.

Table 13. Summary of hypotheses and results

The table presents the hypotheses of the study and the methods used to analyze them along with the results. In the method column ES denotes event study, REG, denotes ordinary least squares regression and SA denotes separate analysis.

Hypothesis		Method	Result
H1	*Abnormal returns in the merger agreement announcement event for the sample. of completed mergers are higher than for the whole sample*	ES	**Moderate evidence**
H2	*Abnormal returns in the merger completion announcement event are positively. correlated with the level of debt used in the transaction.*	REG	**No evidence**
H3a	*Abnormal returns in the merger agreement announcement event are negatively. correlated with the cost of debt*	REG	**Weak contradicting evidence**
H3b	*Abnormal returns in the merger completion announcement event are negatively. correlated with the cost of debt*	REG	**Weak contradicting evidence**
H4	*Abnormal returns in the merger completion announcement are higher for deals. that use stock as payment.*	REG	**No evidence**
H5a	*Abnormal returns in the merger agreement announcement event are negatively. correlated with daily trading volume*	REG	**Weak evidence**
H5b	*Abnormal returns in the merger completion announcement event are negatively. correlated with daily trading volume*	REG	**No evidence**
H6a	*Abnormal returns in the merger agreement announcement event are negatively. correlated with the SPAC IPO gross proceeds*	REG	**No evidence**
H6b	*Abnormal returns in the merger completion announcement event are negatively. correlated with the SPAC IPO gross proceeds*	REG	**Very weak evidence**
H7a	*Abnormal returns in the merger agreement announcement event are positively. correlated with the time left in the acquisition window.*	REG	**Weak evidence**
H7b	*Abnormal returns in the merger completion announcement event are positively correlated with the time left in the acquisition window.*	REG	**No evidence**
H8a	*Pre-announcement abnormal returns start to accumulate prior to the merger agreement announcement.*	ES	**Moderate evidence**
H8b	*Pre-announcement abnormal returns start to accumulate prior to the merger completion announcement.*	ES	**No evidence**
H9	*Trading volumes do not increase immediately after a merger is completed.*	SA	**Strong evidence**
H10	*Abnormal returns in the merger completion event are negatively correlated with. the size of the deferred underwriter's fee*	REG	**Strong evidence**
H11a	*Abnormal returns in the merger announcement event are positively correlated with the amount of IPO proceeds placed in trust fund.*	REG	**No evidence**
H11b	*Abnormal returns in the merger completion event are positively correlated with the amount of IPO proceeds placed in trust fund.*	REG	**Strong evidence**

7.3. Suggestions for further research

The topic of SPACs has barely been scratched with this thesis, but the ground has been laid for further studies. I have categorized possible themes for further research into three different categories; (i) valuation, (ii) deal characteristics and (iii) investor behaviour.

7.3.1. Valuation

SPAC valuation shares similarities with closed-end fund valuation, which has puzzled academics for a long time. Now that a consensus on closed-end funds is starting to form, SPACs present a new challenge to tackle.

In section 6.3.2 I presented a explorative theory on why SPAC share prices behave as they do at the merger completion. Especially the dynamic between a potential goodwill or premium and the dilution from original shareholder's shares is an interesting question. Unlike in closed-end funds, a major challenge arises from the existence of the conversion option which restricts the share price movement prior to the merger. Also the role and size of the perceived liquidity discount warrants a closer examination.

Relating to the topic of SPAC valuation is the examination of SPAC portfolio construction. Can efficient portfolios be constructed with SPACs? What are the implications for portfolio managers? Is it feasible to value the merger proposals with great detail to improve decision-making in the shareholder vote?

Final topic related to SPAC valuation is the understanding of the logic of the unit offering and management's commitment to purchasing warrants in a private placement. An especially intriguing question is that can a target company benefit from the outstanding warrants and if so, under what circumstances?

7.3.2. Deal characteristics

Focusing on SPAC characteristics, this study almost completely ignored the characteristics of the merger. An examination of target companies and more careful dissection of the deal parameters may reveal new avenues in understanding SPACs.

Partially belonging under this topic is also the role of the underwriter in all phases of a SPAC's life cycle. Evidence from this study suggests that a critical review of underwriter's role in the spirit of Bodnaruk et al. (2007) may yield interesting results.

7.3.3. Investor behaviour

Considering the dismal share price development after the merger as documented in this study we are left with the question of why do investors approve deals that destroy shareholder value? The question is especially intriguing when they have a clear walkaway position with minimal losses. Understanding this aspect also yields a more comprehensive picture on

SPACs as an asset class as it may answer the bottom question of why there is demand for SPACs. In addition, a study where a portfolio of SPACs is constructed could show if such portfolio is able to yield positive returns.

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